

Chemical Week

In 1957,
chemical firms
plan to spend

29% more

for new plants
than they did
in 1956

... p. 28



keeps tobacco fresh . . . keeps gas dry

Diethylene glycol's ability to absorb moisture rapidly makes it valuable both as a humectant and as a dehydrant. It's also a solvent and chemical intermediate.

Mathieson diethylene glycol will meet your most exacting requirements

of quality and supply. It's available in tank cars, tank trucks and resin-lined drums directly from the manufacturing point at Brandenburg, Ky., or from strategic distribution points. Contact your Olin Mathieson representative today.

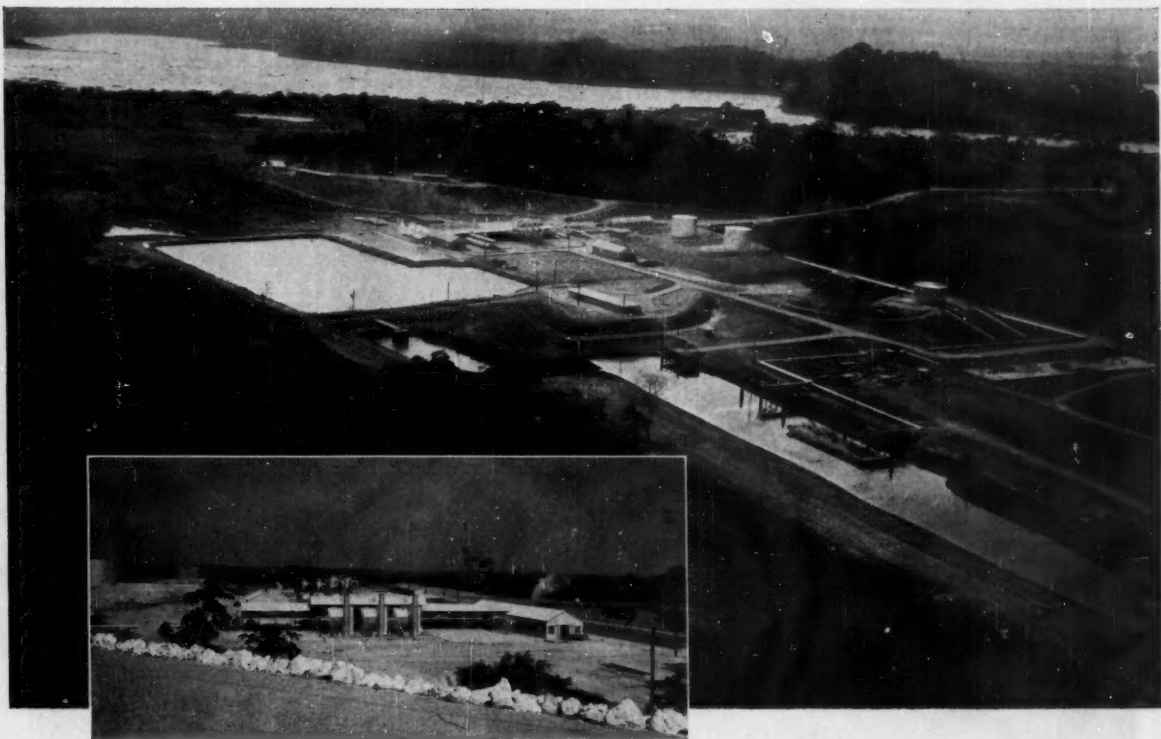


MATHIESON CHEMICALS

OLIN MATHIESON CHEMICAL CORPORATION

INDUSTRIAL CHEMICALS DIVISION • BALTIMORE 3, MD.

INORGANIC CHEMICALS: Ammonia • Bicarbonate of Soda • Carbon Dioxide • Caustic Potash • Caustic Soda • Chlorine • Hydrazine and Derivatives • Hypochlorite Products • Muriatic Acid • Nitrate of Soda • Nitric Acid • Soda Ash • Sodium Chlorite Products • Sulphate of Alumina • Sulphur (Processed) • Sulphuric Acid
ORGANIC CHEMICALS: Ethylene Oxide • Ethylene Glycols • Polyethylene Glycols • Glycol Ether Solvents • Ethylene Dichloride • Dichloroethylene • Formaldehyde
Methanol • Sodium Methylate • Hexamine • Ethylene Diamine • Polyamines • Ethanolamines • Trichlorobenzene • Polychlorobenzene • Trichlorophenol



Sulphur

FROM NEW MINING PROJECT IN MEXICO OF GULF SULPHUR CORPORATION

Since June, 1956, Gulf Sulphur has been producing sulphur by the Frasch method on the Isthmus of Tehuantepec. The completed project, designed and installed by Hudson, includes water treating and hot water plant, pipelines, relay stations, canals, docks, liquid sulphur barges, solid sulphur storage, and staff housing. This efficiently operating plant with complete dock facilities at Coatzacoalcos makes available to world markets the large sulphur reserves of Gulf Sulphur Corp.

Production capacity is 1500 long tons per day with present plant facilities which are designed for expansion to produce 3,300 tons per day.

The completion of these facilities on the Isthmus of Tehuantepec adds to the long list of clients entrusting to Hudson the design, procurement and construction of major mining, chemical and petroleum plant projects in the United States, Mexico, South America, Canada, Europe, the Orient, and the Near East.

DESIGNERS AND CONSTRUCTORS OF
MINING, CHEMICAL, PETRO-CHEMICAL
AND OIL AND GAS PROCESSING PLANTS

HUDSON
ENGINEERING CORPORATION

FAIRVIEW STATION • HOUSTON, TEXAS

What a difference in latex paints . . .

...with

CELLOSIZE

WP-4400...



Nonionic CELLOSIZE WP-4400 gives clean, bright colors with minimum sheen variation.

a new, nonionic, water soluble thickener

Your search for an excellent, nonionic, water soluble thickener for latex paints is over. The answer: CELLOSIZE Hydroxyethyl Cellulose WP-4400, a free-flowing, white powder. Its viscosity in 2% aqueous solution—3500-5000 cps. Look at the added advantages you get with this excellent thickener—

In Production

- Goes into solution readily at room temperature—this saves you time and money
- Stability in presence of dissolved salts is outstanding
- Reduces foaming in mixing kettle
- Contributes to mechanical, freeze-thaw and viscosity stability
- Won't gel at elevated temperatures

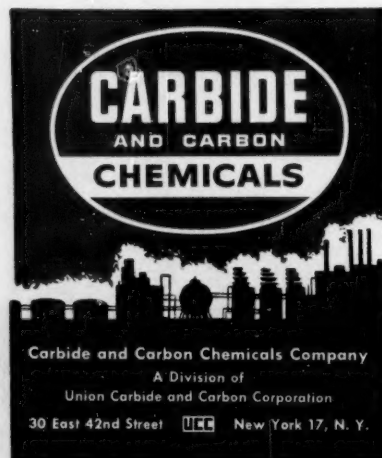
In Application

- Contributes to better scrub resistance and washability
- Improves brushing, leveling, and flow-out
- Gives excellent color values, especially with popular deep decorator colors
- Reduces sheen variation
- Reduces pinholing
- Helps improve hiding power

Now is the time to get your samples and technical data. Write to Carbide and Carbon Chemicals Company, Room 328, Dept. H, 30 E. 42nd Street, New York 17, New York.

In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal and Toronto.

The term "Cellosize" is a registered trademark of UCC



Carbide and Carbon Chemicals Company
A Division of
Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

TOP OF THE WEEK

December 15, 1956

General Tire wants bigger external chemical sales, plans to spend \$10 million to achieve themp. 31

Blaw-Knox finds profit in the fading line between chemical and metallurgical processesp. 70

Adequate supply is at last in sight for aluminum users as old-line, new and potential producers get ready to up U.S. capacity some 44% by 1960p. 79

17 BUSINESS NEWSLETTER

grams for tanks and heat exchangers

22 OPINION

75 TECHNOLOGY NEWSLETTER

26 MEETINGS

28 BUSINESS NEWS

Chemical firms now plan to boost capital spending to \$1.9 billion in '57

31 Cabot Carbon will build at Tuscola, Ill. Reason: to be close to raw materials

32 WASHINGTON ANGLES

34 ADMINISTRATION

Nonunion wages now press union pay rates in heavy-chemicals plants

36 Your present and future Canadian patents — will they be 'watered down'?

41 CHARTING BUSINESS

43 CW REPORT

New chemicals for industry —in '56, again a formidable lineup

70 PRODUCTION

74 Standards planners, near goal on pumps, outline pro-

79 MARKETS

87 SPECIALTIES

Chemical specialties makers meet in Washington, hear plenty about a host of new products

92 Shulton will make powerful new pyrethrin synergist

99 MARKET NEWSLETTER

102 RESEARCH

New anti-arthritis steroids post gains in clinical trials

104 Survey of research titles pinpoints growing need for standardization

108 SALES

Survey of chemical industry Christmas business-gift practices shows many give, but few like to

110 Monsanto comes out with new distributor bulletin

112 Brooklyn wharf blast damage set at \$15 million

Vol. 79

No. 24

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N.Y. Printed in U.S.A. Second-class mail privileges authorized at Philadelphia, Pa. © Copyright 1956 by McGraw-Hill Publishing Co., Inc. All rights reserved. Subscription: \$3.00/year in U.S.A., U.S. Possessions and Canada; \$15.00 in other Western Hemisphere countries; \$25.00 in all other countries.

Diethyl
carbamy
chloride

3,5-Dinitro-
benzoic
acid

Diphenylaceto-
nitrile

MANUFACTURED BY

gamma

chemical corporation

GREAT MEADOWS, N. J.

SOLE SALES AGENTS

Fisher

chemical co., inc.

220 E. 42nd STREET, NEW YORK 17, N. Y.

Murray Hill 2-2587

CABLE ADDRESS: PHARCHEM

ACETYLENE



PORTLAND, ORE

Economically Available in Many CHOICE PLANT SITE AREAS

Is your proposed new chemical plant site in one of the six large areas served by LINDE acetylene sources shown on this map? Or have you been hesitating to locate, because of the acetylene supply problem? In either case, you will be interested in these facts:

Established plants of UNION CARBIDE at Niagara Falls, Ashtabula, The Soo, Montague, Portland, and Moundsville (on stream, summer of 1956) have facilities for producing the high purity acetylene you need. In and adjacent to these industrial centers, you can get either acetylene by pipeline or calcium carbide in bulk at minimum cost. And in vast areas surrounding these plants, where transportation rates are favorable, it is economically sound for you to use carbide with LINDE's acetylene generators.

PIPELINE ACETYLENE OR BULK CARBIDE

Where feasible, it is most economical to obtain acetylene by pipeline direct from the source. LINDE acetylene is available by pipeline adjacent to or near the UNION CARBIDE plants shown. UNION carbide can be economically shipped up to hundreds of miles . . . in hopper cars, special con-


tainer cars or trucks, or drums.

LINDE's engineers, industrial planners, and seasoned traffic men are eager to help chemical companies secure a plant location in one or another of the zones where LINDE acetylene or carbide is economically obtainable. Our traffic and freight

experts have made careful and extensive studies of freight rate differentials as they affect shipment of bulk carbide. This, and other information not readily available, can be furnished on your request. Please write or phone LINDE's Carbide-Acetylene Department.

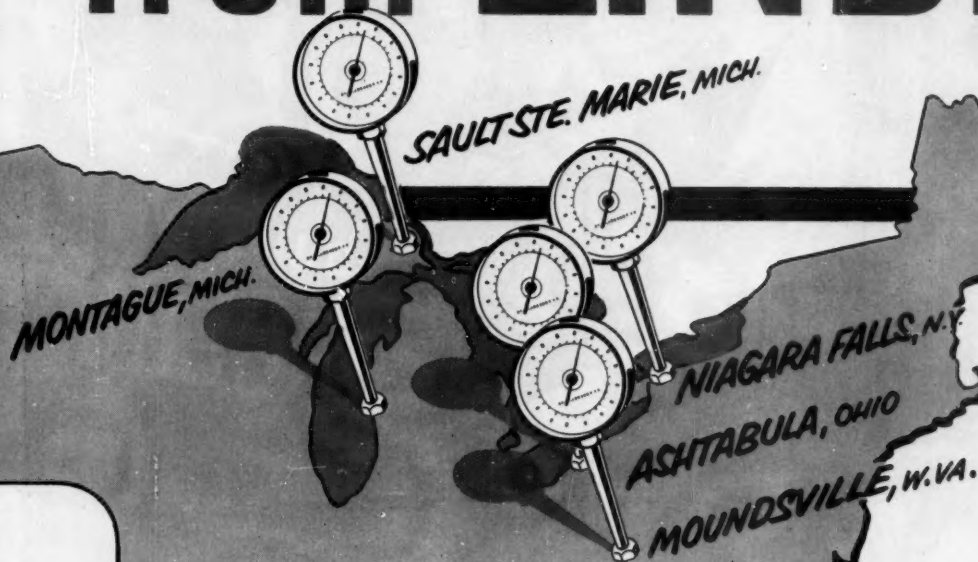
LINDE AIR PRODUCTS COMPANY

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street  New York 17, N. Y.

Offices in Other Principal Cities

from LINDE



YOUR PLANT, located in one of these areas, will have these ADVANTAGES...

Niagara Falls, Ashtabula, Moundsville and Montague are established chemical centers. At these plants and at Portland, chlorine, HCl, by-product lime hydrate, and other raw materials can be obtained nearby. In all six areas, electric power is convenient... cooling water is plentiful... rail, water, and highway transportation are right at hand. Numerous markets already exist for many chemical products in each area.

Linde
Trade-Mark

The terms "Linde" and "Union" are registered trade-marks of Union Carbide and Carbon Corporation.

We Like To Keep Telling You



You are aware that Procon is a leading construction organization. But we're not sure that you know the extent of our world-wide operations, the broad range of projects that Procon is efficiently handling in the petroleum, petrochemical and chemical industries.

That's the reason we like to keep telling you that Procon is actively concerned with construction projects throughout the world. The rapidly growing list includes:

Atmospheric, Cresol and Vacuum Distillation units	Gas Concentration units
Fluid Catalytic crackers	Crude stabilizers
Poly plants	Office buildings
Catalytic reformers	LPG facilities
Rexformers	Hydrosulfurizers
Thermal crackers	Complete refineries
Waste disposal systems	Turnarounds

That's only a partial list, but if you have a project in the planning stage you can be certain that Procon has the experience, know-how and adequate facilities to handle it. Just give us a chance!

PROCON *Incorporated*

1111 MT. PROSPECT ROAD, DES PLAINES, ILLINOIS, U. S. A.

PROCON (CANADA) LIMITED, TORONTO 18, ONTARIO, CANADA

PROCON (GREAT BRITAIN) LIMITED, LONDON, W. C. 2, ENGLAND

PROCON INTERNATIONAL S. A., SANTIAGO DE CUBA

WORLD-WIDE CONSTRUCTION FOR THE PETROLEUM, PETROCHEMICAL, AND CHEMICAL INDUSTRIES

	Dytol A-24	Dytol B-35	Dytol E-46	Dytol J-68
% Decyl (C ₁₀)	1.5	1.5	none	1.0
% Lauryl (C ₁₂)	71.0	60.0	none	80.0
% Myristyl (C ₁₄)	27.0	25.0	1.2	19.0
% Cetyl (C ₁₆)	0.5	13.0	34.0	none
% Stearyl (C ₁₈)	none	0.5	64.8	none

There's something new in DYTOL Alcohols



With its high lauryl content, DYTOL J-68 promises to be especially valuable as an intermediate for synthetic detergents. This new fatty alcohol means that the DYTOL family now offers the answer to a wide range of product problems.

You'll want to investigate these fatty alcohols if you make cosmetics, polymerization regulators, lubricating oil additives, textile finishing and softening agents, quaternary ammonium compounds, emulsifiers and detergents.

DYTOL alcohols are available in quantity, are known for their high uniform quality. They undergo the reactions typical of alcohols: ethoxylation, sulfation, esterification, halogenation, dehydration and oxidation. Write to Department SP today for more data.

DYTOL is a trade-mark,
Reg. U. S. Pat. Off. and in principal foreign countries.



Chemicals for Industry
**ROHM & HAAS
COMPANY**

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

See for yourself is your best source

Monsanto, a basic producer of both alkyl benzene and phosphorus, manufactures SANTOMERSE* and STEROX* surfactants, phosphoric acid, phosphate compounds and many other chemicals used by the detergent industry. A continuous program of progressive application research is also maintained at Monsanto.

It's quicker, easier and more economical to get all your detergent chemicals from Monsanto. Here's why:

Complete Line of detergent chemicals to choose from:

Assured Supply because Monsanto is the world's largest producer of elemental phosphorus.

Technical Service. Ready to serve you is a staff of widely experienced experts, which the size of Monsanto and the completeness of its line demand.

Impartial Advice because Monsanto makes products in every broad classification used by detergent formulators.

Special Shipping Service. No extra charge for palletized bags, color coding, lined cars and many other shipping "extras."

One-Stop Service with these important economies and conveniences:

One group of people serves you. Salesmen and warehousemen work together on your order as a single co-ordinated team.

Protection against costly delays. One order instead of several cuts down chances for clerical errors that can delay your production.

Save money on paper work. On the average, it costs a company \$4.50 to get out a single purchase order. Think how much a *single order* to Monsanto can save you!

Fast, perfectly timed delivery. Everything you need is shipped from a single Monsanto storage point nearest you—usually in just a few hours after your order comes in.

Here is a product listing for your file:

DETERGENT INTERMEDIATES

Alkyl Benzene
Phosphoric Acid
Dodecylbenzene Sulfonic Acid

PHOSPHATE SALTS

Monosodium Phosphate
Disodium Phosphate
Trisodium Phosphate
Tetrasodium Pyrophosphate
Sodium Tripolyphosphate
Sodium Acid Pyrophosphate
Tetrapotassium Pyrophosphate
Monopotassium Phosphate
Tripotassium Phosphate
S Q Phosphate

SURFACE-ACTIVE AGENTS

Each developed for specialized applications

Anionic (Alkyl aryl sulfonates)

Santomerse No. 1
Santomerse 80
Santomerse S
Santomerse SX
Santomerse 3 Paste
Santomerse E

Nonionic (Polyoxyethylene esters, ethers and thioethers)

Sterox CD
Sterox AJ
Sterox SK
Sterox 6

BUILT DETERGENTS

Sterox AWS
Detergent MXP*

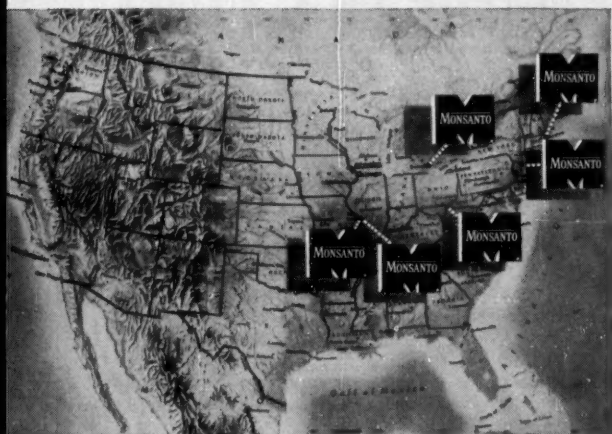
*Reg. U. S. Pat. Off.

Why Monsanto for detergent chemicals



Quality Control at every step—because Monsanto is basic. It controls manufacture from raw material to finished

product. This sample library, for instance, contains specimens of every order shipped to customers.



Rapid Delivery . . . no matter where you are. Santomerse and Sterox surfactants and detergent phosphates are manufactured in Michigan, Missouri, Illinois, West Virginia, New Jersey, Massachusetts. Shipments of surface-active agents and detergent builders are made from many warehousing points.

World's largest producer of elemental phosphorus

For service, further information and/or copy of "Sodium Phosphates in Industry," phone the local Monsanto Office or write: MONSANTO CHEMICAL COMPANY, Inorganic Chemicals Division, Dept. CW-2, 710 North Twelfth Blvd., St. Louis 1, Mo.



WHERE CREATIVE CHEMISTRY WORKS WONDERS FOR YOU.

Ordering Solvents
or Chemicals?

ONE CALL
DOES IT
ALL!



products of the
SOLVENTS and
CHEMICALS GROUP

Aliphatic Petroleum Naphthas
Alcohols and Acetates
Alkanolamines
Aromatic Solvents,
Petroleum and Coal Tar
Chlorinated Paraffins
Chlorinated Solvents
Dowanol and Glycerine
Glycols and Glycol Ethers
Ketones and Ethers
Oils and Fatty Acids
Plasticizers
Resinates Sodium and Potassium
Rosins Gum and Wood
Stearates
Terpene Solvents
Waxes

What you want . . . when you want it . . . where you need it . . . all with just one phone call! That's the new "department store" way to order solvents and chemicals. It's the modern distribution system that saves you time, work and money.

One Order! Get top-quality products made by America's leading producers . . . delivered in drums, tank trucks, transports or tank cars.

One Delivery! Your order delivered within 24 hours in most cases through 17 service locations.

One Invoice! In many instances, orders for several products can be combined to give you even lower costs.

One Payment! Lower receiving costs and less paper work mean extra savings. You can maintain lower inventories and get insurance savings, too!

Investigate this modern, time-saving, money-saving service. Call your nearby member of the Solvents and Chemicals Group or write . . .

AMSCO SOLVENTS & CHEMICALS CO.

4619 Reading Road—Elmhurst 1-4700
Cincinnati 29, Ohio

BUFFALO SOLVENTS & CHEMICALS CORP.

Box 73, Station 8—Bedford 1572
Buffalo 7, New York

CENTRAL SOLVENTS & CHEMICALS CO.

2540 West Flournoy Street—SEaley 3-0505
Chicago 12, Illinois

DIXIE SOLVENTS & CHEMICALS CO.

Diide Highway at Appleton Lane—Emerson 8-5828
Louisville 16, Kentucky

HOOISIER SOLVENTS & CHEMICALS CORP.

1650 Luett Ave.—MElroee 8-1361
Indianapolis 22, Ind.
Nelson Road East—Anthony 0213
Fort Wayne 8, Ind.

MISSOURI SOLVENTS & CHEMICALS CO.

419 De Soto Ave.—GARfield 1-3495
St. Louis 7, Missouri
2522 Nicholson Ave.—CHEstnut 1-3223
Kansas City 20, Missouri

OHIO SOLVENTS & CHEMICALS CO.

3470 W. 140th St.—CLearwater 2-1100
Cleveland 11, Ohio

SOUTHERN SOLVENTS & CHEMICALS CORP.

917 Jefferson Highway, P.O. Box 4067
Carrollton Station—VERnon 3-4666
New Orleans 18, Louisiana

TEXAS SOLVENTS & CHEMICALS CO.

8501 Market Street—DRichard 2-6683
Houston 28, Texas
2500 Vinson Street—Federal 5428
Dallas 12, Texas

TOLEDO SOLVENTS & CHEMICALS CO.

4051 South Avenue—Jordan 3771
Toledo 14, Ohio

WESTERN SOLVENTS & CHEMICALS CO.

6472 Selkirk Ave.—WAlnut 1-4350
Detroit 11, Mich.

WESTERN SOLVENTS & CHEMICALS CO.

(CANADA) LTD.
1454 Crawford St.—CLearwater 2-0993
Windsor, Ontario, Canada

WISCONSIN SOLVENTS & CHEMICALS CORP.

1719 South 83rd St.—GRreenfield 6-2630
Milwaukee 14, Wisconsin

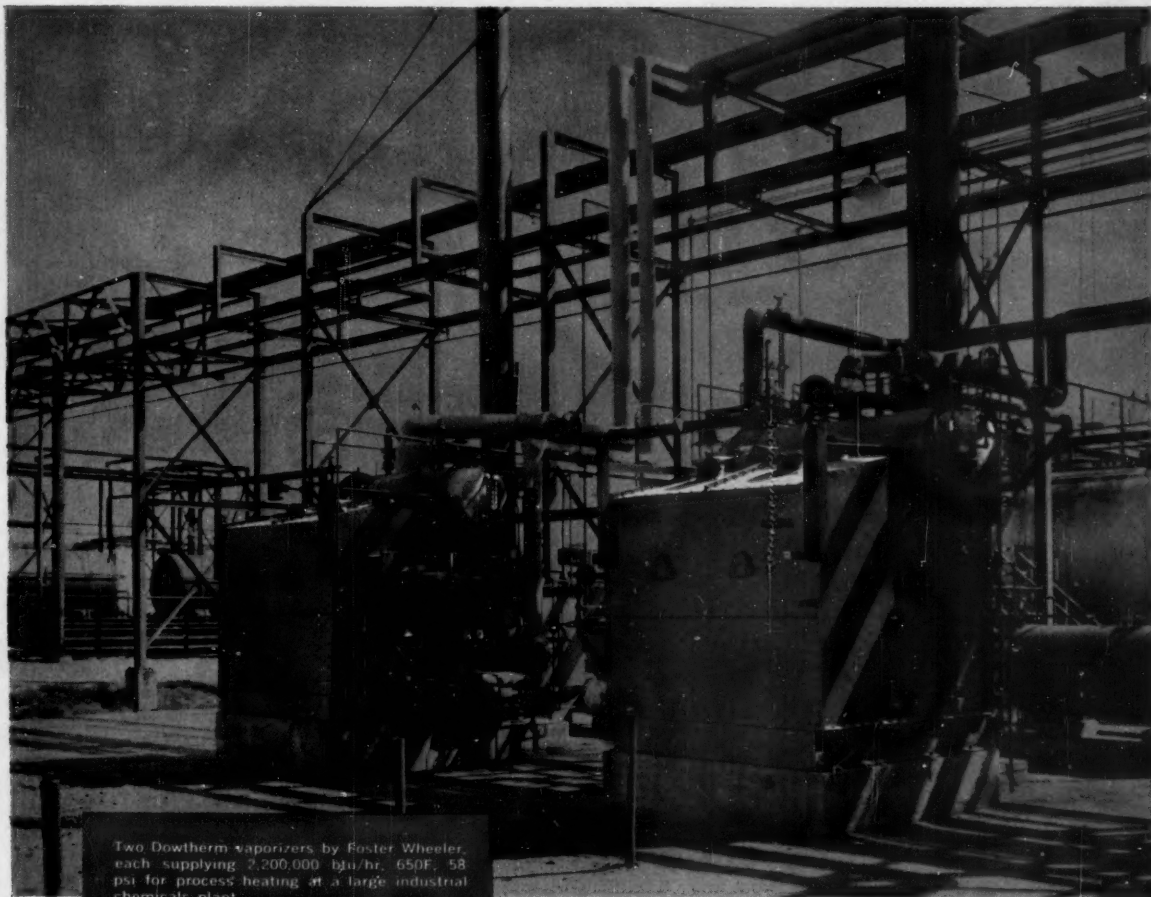
WOLVERINE SOLVENTS & CHEMICALS CO.

1500 Century Ave., S.W.—CHerry 5-9111
Grand Rapids 9, Michigan



THE SOLVENTS AND CHEMICALS GROUP

2540 West Flournoy Street • Chicago 12, Illinois



Two Dowtherm vaporizers by Foster Wheeler, each supplying 2,200,000 btu/hr, 650F, 58 psi for process heating at a large industrial chemicals plant.

in high temperature, low pressure heating

ONLY FW DOES THE COMPLETE JOB

Design and Engineering. High temperature Dowtherm heating systems by Foster Wheeler are specially designed and engineered to meet your specific process requirements to best advantage.

Installation. Foster Wheeler can supply and install the complete heating system — making sure that every detail of the installation is right for the job.

Operation. Foster Wheeler responsibility follows through to the successful operation of the entire system. Proper functioning of all elements is positively assured.

Service. Foster Wheeler's skilled engineers and service personnel are available at all times—to assure continued trouble-free operation or to assist in any process changes or relocation of equipment.

During the past 23 years of service to the process industries, Foster Wheeler has installed over 500 Dowtherm heating systems, in individual units from 44,500 to 45,000,000 btu/hr, 700F, 88 psi. We will be glad to study your requirements and point out how FW high-temperature, low-pressure heating systems will improve your process and cut your heating costs. For complete information, write for Bulletin ID-54-5. *Foster Wheeler Corporation, 165 Broadway, New York 6, N.Y.*

FOSTER WHEELER

NEW YORK • LONDON • PARIS • ST. CATHARINES, ONT.

Chemical men

test and experiment, sift and weigh, check and compare



Plant Location men

depend on precise and accurate research, too

Our plant location specialists are research-minded because they know that facts are needed in order to make a wise plant location decision — and facts are developed through research.

These Norfolk and Western men know, too, that the best time to begin site research is well in advance of ground-breaking, while plans are still at the drawing board stage. This permits ample time for fact gathering and analysis, which can save you many hours of site-seeking later on.

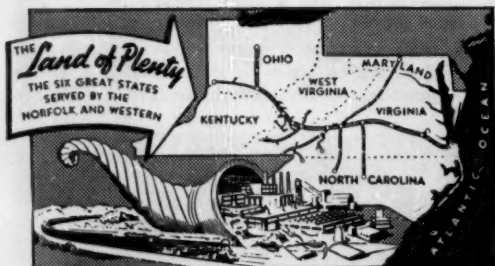
Industry — all types and all sizes — has received valuable assistance from the N&W's plant location specialists. These men can be especially helpful to you, for they have professional backgrounds in the field of chemistry.

Furnish them an outline of your specific requirements, and they will go to work for you confidentially and without obligation. You can depend on their information to be factual, complete and up-to-date.

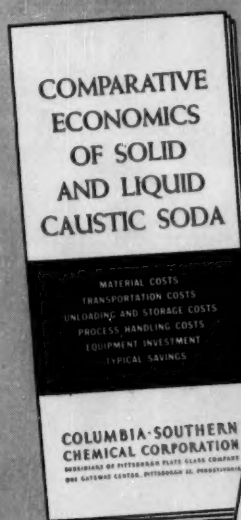
And remember — the Land of Plenty is rich in all the essential elements needed for successful chemical manufacturing.

Write, Wire or Call—

L. E. Ward, Jr., Manager
Industrial and Agricultural Dept.
Drawer CW-743, (Phone 4-1451, Ext. 474)
Norfolk and Western Railway
Roanoke, Virginia

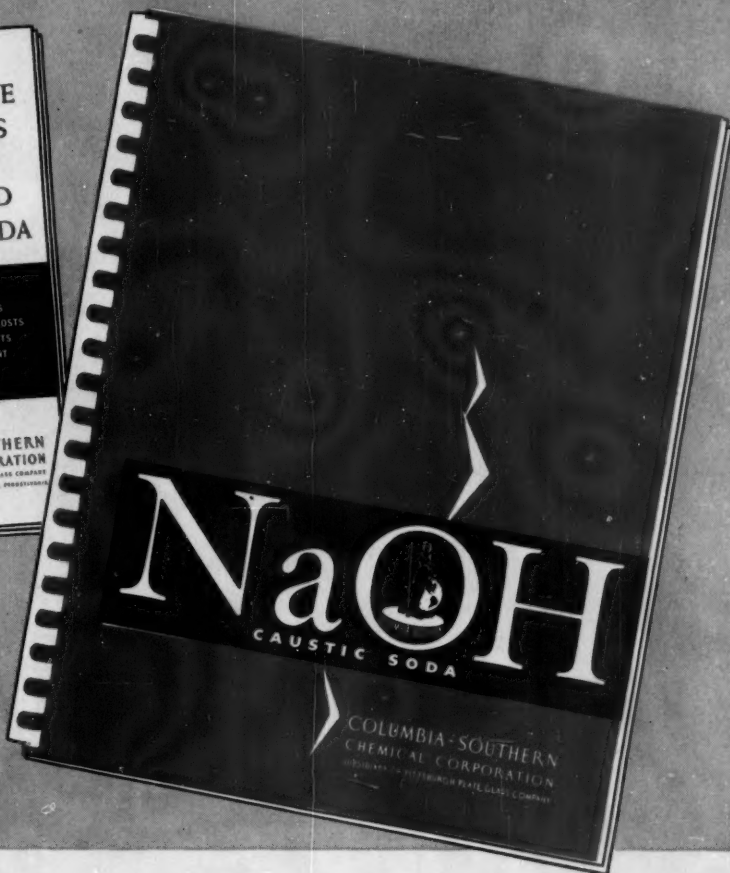


Norfolk and Western RAILWAY



Booklet, 3 1/4" x 8 1/2". Contains 12 compact pages on the economics of Caustic Soda. Answers many important questions such as, "What form of Caustic Soda should I buy? How do I figure costs? How much will I save? What equipment will I need?"

Manual, 8 1/2" x 11", plastic bound. Contains 64 factual, illustrated pages—including charts, tables, diagrams—on analysis, shipping, handling, storage and unloading. It is the authoritative handbook on Caustic Soda.



Do you have these two valuable books on caustic soda?

If your work involves the handling, use, purchasing, or economics of Caustic Soda, and you do not have these books, you are urged to write for your free copies today. Ask for "Caustic Soda Manual" or "Caustic Soda Economics Booklet." If you want both, please specify. Please use company stationery and send your request to Columbia-Southern Chemical Corporation, One Gateway Center, Pittsburgh 22, Pennsylvania.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
ONE GATEWAY CENTER · PITTSBURGH 22 · PENNSYLVANIA



DISTRICT OFFICES: Cincinnati
Charlotte • Chicago • Cleveland
Boston • New York • St. Louis
Minneapolis • New Orleans
Dallas • Houston • Pittsburgh
Philadelphia • San Francisco

IN CANADA: Standard Chemical
Limited and its Commercial
Chemicals Division



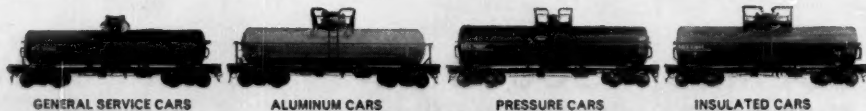
What does an engineer do for GATX?

Engineering a special-purpose tank car is a job for experts. Stress, mobility, center of gravity, corrosion resistance—these are a few of the factors to be considered. At General American you'll find engineering specialists—men who pioneered with aluminum tank cars. These made possible bulk shipments of hard-to-handle liquids. You'll find men who developed the first flued-dome tank car, the first all-welded underframes, the first half-oval heater coils—and a long list of additional improvements.

This engineering skill and experience that make such developments possible is part of every GATX lease—a lease that provides shippers with the most dependable service available for bulk liquid transportation. When you lease cars from General American, you avoid the need for capital investment as well as operating, servicing and maintenance problems.

If you'd like additional information concerning the advantages of a GATX lease, call or write your nearby General American District Office.

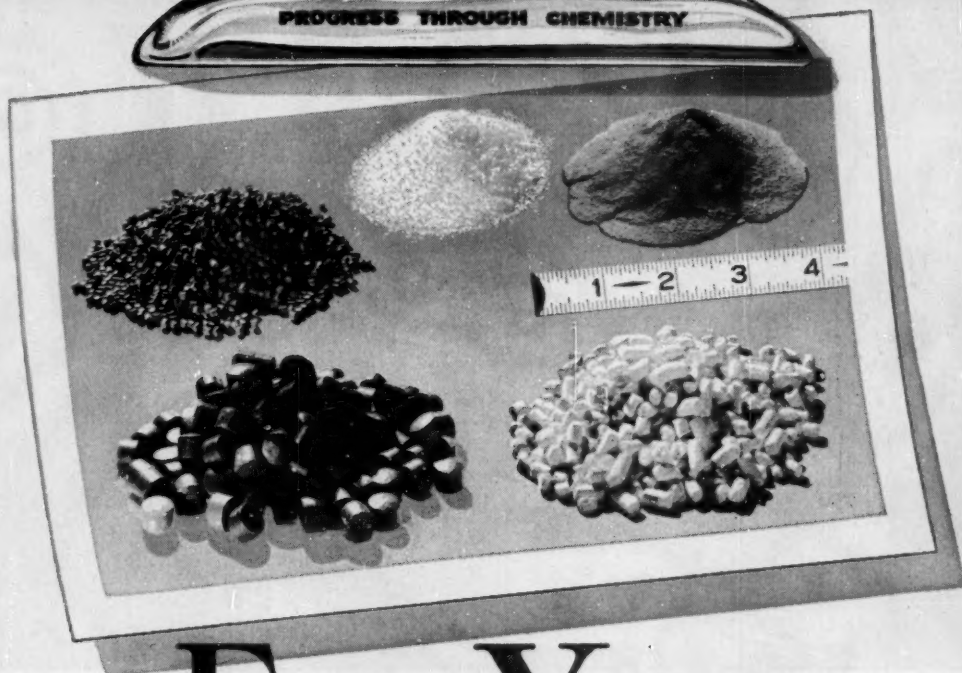
It Pays to Plan With General American



GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South LaSalle Street • Chicago 90, Illinois
Service Offices In Principal Cities
Service Plants Throughout The Country

PROGRESS THROUGH CHEMISTRY



For You Catalyst "Know-How"

What makes one catalyst superior to another? Often it is the unseen ingredient, "know-how". Davison's long experience in successful catalyst production gives you this all-important element.

Davison, the first commercial producer of synthetic petroleum cracking catalysts, operates a modern plant for the sole purpose of producing specialty catalysts to aid industrial chemical progress. These catalysts can be custom made to your specification. We guard your "know-how" as carefully as we do our own. They are made in many forms including granular, pelleted, powdered, spherical, extruded and include many supports and active agents.

Put Davison's "know-how" to work on your problem. No matter what your catalyst requirements are, it will pay you to discuss them with the Davison Field Service Engineer. A free booklet on Davison dependable catalysts is available on request.

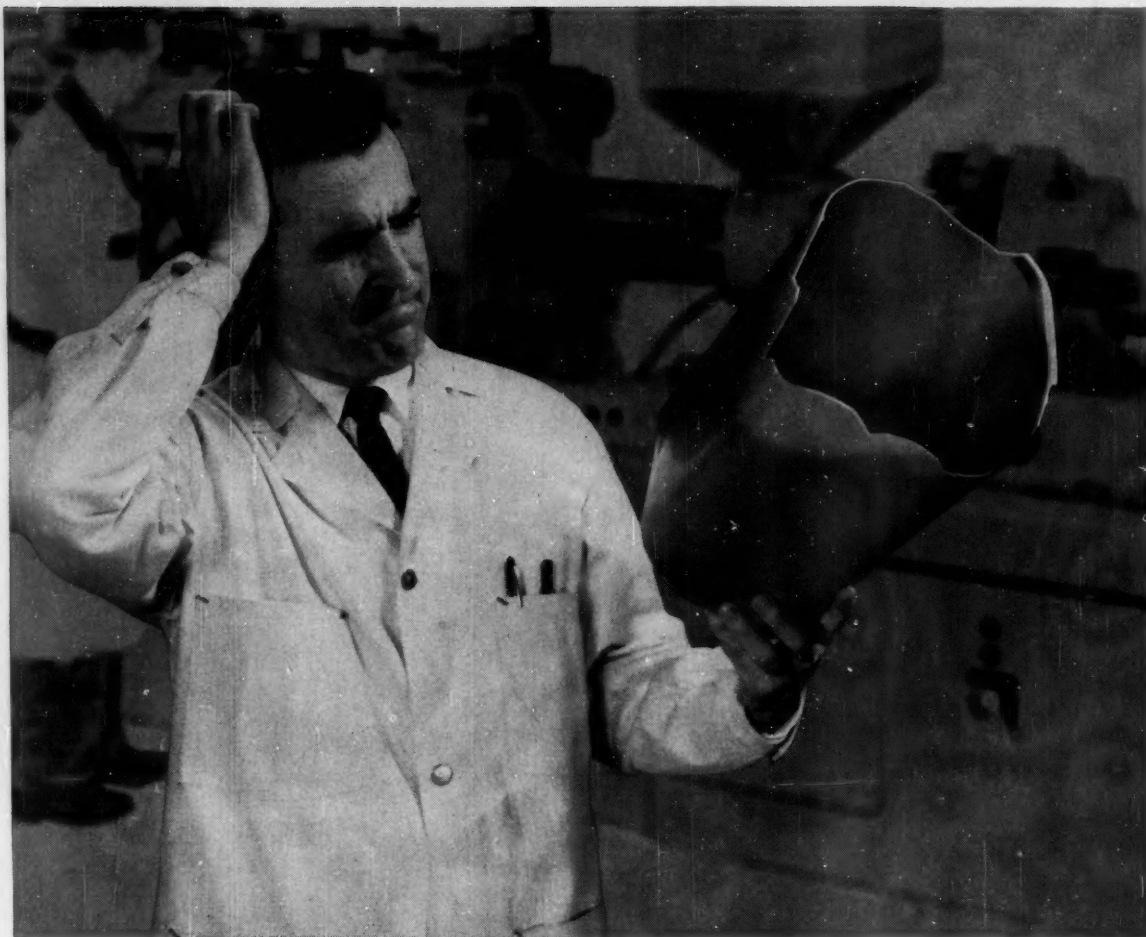
DAVISON CHEMICAL COMPANY

Division of W. R. Grace & Co.

Baltimore 3, Maryland

Sales Offices: Baltimore, Md.; Chicago, Ill.; Columbus, Ohio; Houston, Texas; New York, N. Y.; San Francisco, Calif.

Producers of: Catalysts, Inorganic Acids, Superphosphates, Triple Superphosphates, Phosphate Rock, Silica Gels and Silicofluorides.
Sole Producers of DAYCO® Granulated Fertilizer.



Injection Molders: Are you using the wrong melt index?

Have you found the melt index that gives you *both* good flow characteristics and good "stress-cracking" resistance? Or are you plagued with production problems?

Now you can get the correct melt index resin. A-C POLYETHYLENE technical representatives can show you how to tailor-make the individual melt-index polymer that is exactly right for your product.

A blend of A-C POLYETHYLENE and the proper resin will enable you to get both good flow characteristics and good resistance to "stress-cracking." The use of A-C POLYETHYLENE results in these advantages, too: 1. lowered costs; 2. high gloss; 3. improved color dispersion;

4. increased or equivalent stiffness; 5. reduced cycle time; 6. decreased injection pressures; 7. better mold release.

Mail in the coupon today for assistance in tailoring a melt-index resin to your operation.

SEMET-SOLVAY PETROCHEMICAL DIVISION

Allied Chemical & Dye Corporation
Room No. 801-J
40 Rector Street, New York 6, N. Y.



I want assistance in developing the correct melt-index resin.

Name

Address

City

Zone State

A-C Polyethylene

*trademark

Business Newsletter

CHEMICAL WEEK
December 15, 1956

There'll be news within about 60 days from W. R. Grace on a \$25-million plant to be built at Memphis, Tenn., that will use products from Grace Chemical's current operations there, reports President J. Peter Grace.

The company, Grace reveals, went into ammonia strictly to get into its next planned phase of petrochemical operations. What is it? Grace isn't saying—but he will admit that it is “wholly unrelated to agricultural chemicals,” though it may use high-pressure technology. One possibility: acrylonitrile.

Grace (who spoke to a New York financial group last week) pointed out that when the firm made its major entry into agricultural chemicals via purchase of Davison Chemical, it was more interested in Davison's growing catalyst business.

Grace Chemical, its other fertilizer-producing subsidiary, though suffering somewhat from the farm slump, made a good deal more money in '56 than it did in '55—the first year that its fixed nitrogen units began operations. Ammonia production is at a high level; the plant is operating at 10% over its rated capacity. There have been startup problems at the urea installation at Memphis, and the unit is still producing below capacity, but operations are improving.

Grace reports it has a strong position in the polymer field, one that is considerably strengthened by acquisition from Sequoia Process of world rights to Sequoia's irradiated polyethylene work. Sequoia's process involves adding another material to the polyethylene before irradiation—and Grace feels that this improves the properties of the end-product, compared with what can be obtained by irradiating unblended polyethylene.

The company, too, plans to use this process as “technical currency” in obtaining rights to processes developed by companies in other parts of the world. Grace would trade rights to this process to firms from which it would like to license other processes—but which would be unwilling to give licenses to Grace for dollars alone.

Grace won't neglect its own research, however. During '56, it spent \$6-7 million on research and development. And such expenses don't include preoperating expenses and startup costs of the currently operating semiworks Phillips polyethylene unit at Baton Rouge, or similar costs of paper and chemical projects planned in Latin America.

Where will Grace invest money in the next few years? In paper manufacture and chemical development in Latin America and in chemicals in the U. S. Some \$90 million will be spent in the 1956-58 period in chemicals in the U. S.; \$60 million for the Latin American development.

Business Newsletter

(Continued)

But other expansion projects are being planned to swell the total that the chemical industry plans to spend on new plants in coming years (*see also p. 28*). Highlight this week: the plans of Petroleum Chemicals, Inc.

PCI, a joint subsidiary of Cities Service and Continental Oil, will build a 200-million-lbs./year plant in Lake Charles, La. Big customer could well be Du Pont, in Orange, Tex., which would be supplied with 120 million lbs./year by a still-to-be-built pipeline. The remainder is apparently slated for ethylene oxide and glycol manufacture in a nearby plant for which Conoco and Cities Service will put up some capital.

Linde, too, has major expansion plans for its Ashtabula, O., oxygen plant, though it hasn't yet aired details. A 50% boost in capacity is expected from the new facilities, which reportedly cost about \$12 million. Indications are that Linde's East Chicago, Ind., and Kittanning, Pa., plants will be in for similar boosts.

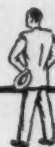
Sylvania Electric Products, Inc.'s Atomic Energy Division has taken options on a "multimillion-dollar" atomic center in Andover, Mass. Sylvania, with Corning Glass Works, plans to organize soon Sylvania-Corning Nuclear Corp. (*CW, Nov. 24, p. 23*), which will operate the center. As now envisioned, the facilities are designed for development and production of nuclear fuel elements. On the 150-acre site, five buildings will be put up, providing 150,000 sq. ft. of space for manufacturing, pilot production, engineering, administration, sales, and related activities. Some 300 will initially be employed at the plant, which Sylvania hopes to have in operation by early 1958.

Not all aspects of expansion are bright, however. Ethyl Corp., which is building new facilities in Sarnia, Ont., and in California, told its employees last Friday that it would have to release about 65 of its 1,000-man force in Houston, beginning about Jan. 1. In a letter to its employees, ethyl blamed its cutbacks on two things: loss of sodium sales to competitors, and TEL demands below expectations. The tougher sodium selling situation—due to competitive process and materials in the soap industry—will mean deactivating some 25 sodium cells. Gasoline use didn't increase as much as expected in 1956, and new catalytic reforming processes create fuels requiring less TEL than long-range estimates had indicated.

Layoffs were cancelled Friday night, though, at several West Coast plants. Firms that expected a power cutback from the Bonneville Power Administration will now be permitted uninterrupted power through adjustment of stream-flow through the Columbia River system reservoirs.

WHAT'S YOUR PROBLEM?

- In the food industry Is it lard improvement?
- In the glass industry Is it temperature control of glass molds?
- In the metallurgical industry Is it alloy modification? Is it titanium manufacture? Is it desulfurization?
- In the petroleum industry Is it stability improvement? Is it petro-chemicals manufacture?
- In the plastics industry Is it monomer manufacture? Is it polymerization catalysis?
- In the pharmaceutical industry Is it a synthesis where you can use sodium alcoholates?
- In the rubber industry Is it butadiene polymerization?
- In the textile industry Is it the synthesis of raw materials for synthetic fibers?
- In the detergent industry Is it the manufacture of fatty alcohols?
- In the dyestuffs industry Is it the synthesis of indigo or other dyestuffs?



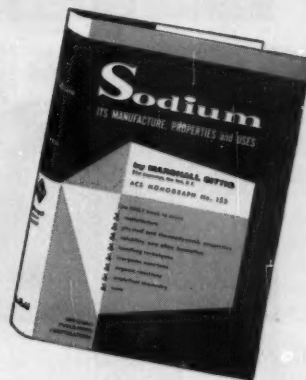
...THE ANSWER MAY BE IN THIS BOOK

Contains 150 illustrations, 2000 literature references.
May be purchased from REINHOLD PUBLISHING CORP.

430 Park Ave.
New York, N. Y.

and if you need sodium, call Ethyl

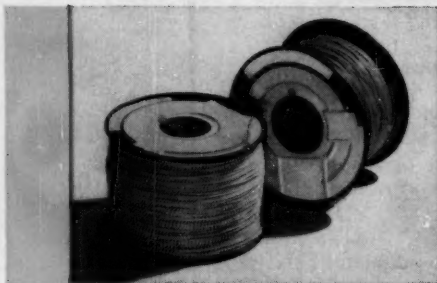
for rapid delivery in containers ranging from one-pound cans to 80,000 lb. tank cars. Bricks available in 1, 2½, 5, 12 & 24 lbs. packed in drums (280-300 lbs. net wt.) Cast solid in non-returnable drums (425 lbs. net wt.)



ETHYL CORPORATION
Chemicals for industry
100 PARK AVENUE, NEW YORK 17, N. Y.

ATLANTA, BATON ROUGE, CHICAGO, DALLAS, DAYTON, DENVER, DETROIT, HOUSTON,
KANSAS CITY, LOS ANGELES, NEW ORLEANS, PHILADELPHIA, PITTSBURGH, SALT LAKE CITY,
SAN FRANCISCO, SEATTLE, TULSA, MEXICO CITY & (ETHYL CORP. OF CANADA LTD.), TORONTO

Protect...decorate...strengthen...with
CELLULOSE ACETATE and CELLULOSE ACETATE BUTYRATE
...versatile film formers by Eastman



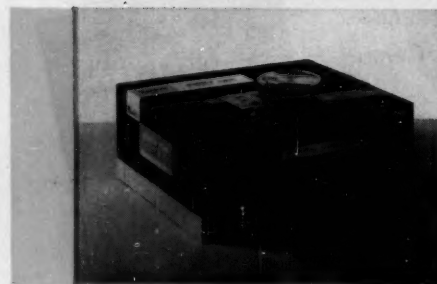
SAFEGUARDING CABLE PERFORMANCE—Among the oldest protective coating applications for Eastman cellulose acetate is wire and cable lacquer. Such lacquers provide an excellent waterproof coating along with toughness and abrasion resistance. Lacquers made with Eastman cellulose acetate butyrate are also used in this field, particularly for the protection of ignition cables and other specialized wiring.



WATERPROOFING FIBER—Half-Second Butyrate (Eastman's low-viscosity cellulose acetate butyrate) is used to make fiber weaving materials water-repellent. The fiber stripping is passed through a hot melt of Half-Second Butyrate, emerging with a clear coating which maintains its gloss and strength despite the damaging effects of repeated washings and outdoor exposure. The coating also resists scuffing and the attack of mild acids and alcohol.



PROTECTING ALUMINUM OUTDOORS—Prolonged testing with a leading user of aluminum trailer trucks shows that clear lacquer made with Eastman Half-Second Butyrate can furnish long-lasting protection for outdoor aluminum surfaces against pitting and spotting. What's more, these lacquers can be applied easily and inexpensively, for no prime coat is needed on properly cleaned surfaces, and the lacquers air-dry in three to five minutes.



IMPROVING PACKAGE APPEARANCE—A superior decorative and protective coating for paper and foil has been found in Half-Second Butyrate. The lacquer shows excellent adhesion over inks, imparts a high gloss, and is outstanding in its resistance to discoloration by sunlight and aging. It is effective in films far thinner than possible with ordinary lacquers, providing greater mileage per gallon. And its superior eye-appeal pays off quickly at the point of sale.

Eastman
 CHEMICAL PRODUCTS, INC.
 KINGSFORT, TENNESSEE
 a subsidiary of EASTMAN KODAK COMPANY

Cellulose esters made by Eastman may be just what you need if you are seeking a film to protect, decorate, seal, cushion or mask some particular product. Eastman cellulose acetates and cellulose acetate butyrate are available with varying acetyl and butyryl contents in a wide range of viscosities. They are used in numerous formulations as special purpose coatings on metal, glass, paper, plastic, foil and wood. For more information on the properties of these Eastman products, call our nearest sales office or write: EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSFORT, TENNESSEE.

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; New York City; Framingham, Mass.; Cincinnati; Cleveland; Chicago; St. Louis; Houston.
West Coast: Wilson Meyer Co., San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

Chemical Week

December 15, 1956

Vol. 79, No. 24

Publisher Wallace F. Traendly
Editorial Director Sidney D. Kirkpatrick
Editor Howard C. E. Johnson
Associate Managing Editors Ralph R. Schulz
 Edward T. Thompson

ASSOCIATE EDITORS

Marketing Anthony J. Piombino
Technology Donald P. Burke

DEPARTMENTS

Administration Homer Starr, *editor*; Leo J. Northart
Business News William Olcott, *editor*; Cooper McCarthy
 Robert L. Porter
Marketing
Markets Jorma Hyypia, *editor*; Frank S. Sciancalepore
Sales John M. Winton, *editor*; Richard J. Callahan
Reports Vincent L. Marsilia, *editor*
Specialties J. R. Warren, *editor*; Charles Joslin
Technology
Production Kenneth Wilsey, *editor*; Herbert C. Short
Research Joseph F. Kalina, *editor*; Emil J. Mikity
Copy William Mullinack, *editor*
Art Donald R. Thayer, *director*; Peter Madden
Buyers' Guide Alvin J. Babkow, *manager*

REGIONAL EDITORS

Midwest Frank C. Byrnes, Chicago
Far West Elliot Schrier, San Francisco
Southwest James A. Lee, Houston

EDITORIAL ASSISTANTS

Marjorie Darby Frances Regan
Nina Seawick Eleanor Sternecker
Betts Silver

NATIONAL NEWS

Economics .. Dexter M. Keezer, *director*
 Douglas Greenwald, Robert P. Ulin
Atlanta A. R. Henry
Cleveland Robert E. Cochran
Detroit Harry Homewood
Los Angeles John Shinn
San Francisco Margaret Ralston
Washington George B. Bryant, Jr.

Correspondents in 73 principal cities.

WORLD NEWS

Editor John Wilhelm
Bonn Gerald W. Schroder
London William J. Coughlin
Melbourne Alicia Grobtsch
Mexico City John H. Kearney
Paris Robert E. Farrell
Rio de Janeiro Peter Weaver
Tokyo Dan Kurzman

Correspondents in 44 principal cities.



Advertising Director Robert S. Muller

Advertising Sales Manager Steven J. Shaw
Business Manager .. Anton J. Mangold
Advertising Salesmen See page 116

Promotion Manager .. E. A. Atwood, Jr.
Market Research Manager A. I. Losick
Market Service Manager .. J. E. Zingale

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Company, Inc. James H. McGraw (1860-1948), founder, Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Publication Office: 1309 Noble St., Philadelphia 29, Pa. Donald C. McGraw, President; Paul Montgomery, Executive Vice-President; Joseph A. Gerardi, Executive Vice-President and Treasurer; Hugh J. Kelly, Executive Vice-President; John J. Cooke, Secretary; Nelson Bond, Executive Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising Sales; J. E. Blackburn, Jr., Vice-President and Circulation Director.

Subscriptions to Chemical Week are solicited from management men in the chemical process industries. Position and company connection must be indicated on subscription order. Address all subscription communications to Chemical Week Subscription Service, 330 W. 42nd St., New York 36, N. Y., or 1309 Noble St., Philadelphia 29, Pa. Allow one month for change of address.

Single copies 35¢. Subscription rates—United States, United States Possessions and Canada, \$3.00 a year; \$4.00 for two years; \$5.00 for three years. Other Western Hemisphere countries, \$15.00 a year; \$25.00 for two years; \$35.00 for three years. All other countries, \$25.00 a year; \$40.00 for two years; \$50.00 for three years.

Second class mail privileges authorized at Philadelphia, Pa. © Copyright 1956 by McGraw-Hill Publishing Co., Inc. All rights reserved.

STEEL PAILS AND DRUMS NOW VULCAN SHIPS IMMEDIATELY



These Sizes Steel Pails
and Drums Available

**1-1½-2-2½-3-3½
4-5-6-6½-7-8-9
10-12 and 15
gallons**

Whether you order a carton, truckload, carload or mixed combinations in the sizes shown, you can depend on Vulcan to ship promptly.

Many buyers find Vulcan's prompt delivery helps them keep container inventories at a minimum . . . no need to keep big stocks of containers on hand to meet production schedules. They order containers when needed . . . in any quantity. Vulcan gets them there in time!

Vulcan's tremendous warehouse stock in all styles and sizes steel pails and drums makes this possible . . . for Vulcan's sole interest is in manufacturing the finest in steel containers.

Vulcan's complete selection of all types nozzles and pouring spouts plus protective interior linings . . . wide choice of container colors . . . expert label design and lithographing facilities makes Vulcan your best source of supply.

So check Vulcan on your next container order. It could pay you in time and money saved!

over 40 years container experience

VULCAN
CONTAINERS, INC.

Bellwood, Illinois (Chicago Suburb)
Phone: Linden 4-5000

In Toronto, Canada—Vulcan Containers Ltd.
Representatives in All Principal Cities

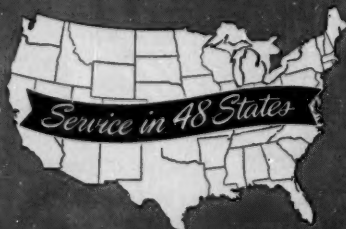
THE BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

All Petroleum Aliphatic - Aromatic - Hydrocarbon Solvents



Get the benefit of Amsco's 30 years of experience meeting the expanding requirements of the protective coating industry.

American Mineral Spirits Company
Chicago • New York • Los Angeles



OPINION

Back to Nature

TO THE EDITOR: Because it deals with a subject long close to our hearts, we were particularly interested in the report (Nov. 3) "Drug Research Heads Back to Nature."

... We have specialized in the procurement and investigation of many new and interesting botanical drugs. We have been privileged to work with a number of pharmaceutical companies, university and college groups in the procurement of rare and not readily available botanicals for their investigations. In the very early days of *Rauwolfia*, our staff experts explored four continents to uncover and obtain basic source materials.

As we have a rather unique vantage point from which we can measure such interests, we agree that drug research is indeed heading back to nature and that botanicals are again being considered as sources of new drugs as well as new leads to be used by medical science. CHEMICAL WEEK is to be complimented for its continued coverage of research trends.

W. G. BYWATER

Vice-President, Research Division
S. B. Penick & Co.
New York

Available—Not Usable

TO THE EDITOR: I read with a great deal of interest the article [on Russian literature] (Oct. 27). . . .

The facts regarding Russian abstracting services have been known to those in the field of documentation and others interested in foreign technical literature since 1953, when the abstracting journals became available.

The really surprising and "newsy" statements in the article are: "Most other Western countries still make their publications available to the Rus-

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to:
H. C. E. Johnson, Chemical
Week, 330 W. 42nd St., New
York 36, N.Y.



35,000 barrels of 83% ammonium nitrate solutions are stored without corrosion in these aluminum tanks. Development was a joint effort between **Sohio Chemical Co., Chicago Bridge & Iron**

Co., and Aluminum Company of America. Alcoa Aluminum Alloy 5052 is used for sidewalls in thicknesses up to 1 1/4". The consumable electrode process was used for all welding.

SOHIO insures stable storage of 83% ammonium nitrate with two 35,000 barrel tanks of ALCOA ALUMINUM

Aluminum will not render ammonium nitrate unstable! That's why Sohio Chemical Company chose Alcoa® Aluminum for two special 35,000 barrel tanks used to store 83% ammonium nitrate solutions produced in a new \$17-million petrochemical plant at Lima, Ohio. Now in full-scale production, the plant yields over 300,000 tons of ammonia and derivatives yearly.

Like so many other petrochemical producers, Sohio has found that Alcoa Aluminum provides an ideal answer to the problem of better, cheaper storage and handling of ammonium nitrate and nitrogen solutions. And the superior corrosion resistance of aluminum gives it extra-long service life under constant exposure to chemicals and plant atmospheres normally corrosive to most metals. That makes Alcoa Aluminum the least expensive material to solve storage and handling problems when product protection and corrosion resistance are vital.

The superior storage and handling performance of Alcoa Aluminum has been proved on-the-job in such

diverse applications as these: fertilizer solution storage tanks, nitrogen chilling exchangers, prilling towers, tank cars, piping and drums. A new Alcoa book, *Process Industries Applications of Alcoa Aluminum*, contains 80 pages packed with performance and design data. To get your *free copy*, write to Aluminum Company of America, 906-M Alcoa Building, Pittsburgh 19, Pa.



THE ALCOA HOUR
TELEVISION'S FINEST LIVE DRAMA
ALTERNATE SUNDAY EVENINGS

A Brighter Future for Teeth...with Tin Chemicals

A CENTURY AGO



tin was playing an interesting role in dentistry—as a filling for teeth. Because tin is more readily attacked by acids than is tooth enamel, the filling was slowly eaten away, while the tooth remained intact. Tin-filled teeth more than forty years old were reported in the dental journals of the day.



TODAY to help teeth last longer, a tin chemical is added to tooth paste. Its history is interesting. For a long time water-borne fluorides have been known to be highly effective against the incidence of tooth decay. To make this protection available in a toothpaste, a form of fluoride was needed that would retain this beneficial characteristic and, in addition, be mild to the human system. M & T Stannous Fluoride is providing the answer to dentistry's need for a product with these specific characteristics.

THE VERSALITY OF TIN CHEMICALS is by no means limited to dentistry. In any field—automotive, aviation, textile, food, plastics—if you're looking for ways to lower costs or improve techniques, it will pay you to get in touch with us—

TIN & TIN CHEMICALS
CERAMIC MATERIALS
ORGANIC COATINGS
WELDING SUPPLIES
RADIOGRAPHIC EQUIPMENT
PLATING MATERIALS
METALS & ALLOYS
HEAVY MELTING SCRAP



"First Name in Tin Chemicals"

**METAL & THERMIT
CORPORATION**

GENERAL OFFICES: RANWAY, NEW JERSEY

OPINION

sians without getting much information in exchange;" or, "Trouble is, the flow is almost completely in one direction (West to East);" and, "U.S. researchers might be well advised to see what they can do to start a flow of information in this direction." . . .

A great many Russian scientific, technical, and trade publications have been generally available since World War II, and a veritable deluge has opened up in the last year or so. The real problem is not getting information "in exchange" or starting "a flow of information in this direction," but to provide enough competent specialists to evaluate, translate and assimilate the available information. The number of available Russian technical journals runs into the hundreds, and the list is continuously increasing. . . .

Anyone who is seriously interested in following Russian scientific literature can profitably subscribe to two publications of the U. S. Library of Congress. One, . . . "Monthly List of Russian Accessions," . . . amounting to some 250 pages of very fine print, lists the Russian-language accessions both in the form of periodicals and monographic works. . . . The other, . . . "East European Accessions List," . . . is . . . similar to that just mentioned . . . that covers a sizable portion of the printed output of the Russian satellite states. The Library of Congress receives by exchange and through other channels many more Russian technical publications than are available by direct subscription.

Anyone interested in learning the titles and scope of Russian technical periodicals available through the Library of Congress need only secure a copy of "Scientific and Technical Serial Publications, Soviet Union 1945-1953" from the science division [of that library]. A hefty checklist of over 300 pages titled "Serial Publications of the Soviet Union, 1939-1951" is also published by the Library of Congress.

In connection with our documentation activities, our library subscribes to numerous Russian journals in the fields of chemistry, physics, chemical engineering, electronics, etc. The list of the journals to which we subscribe is limited only by our budget; to subscribe to all available Russian journals would strain not only the means of a small organization such as ours, but

if you use **ANILINE**

**here are 4 good reasons
to specify NATIONAL!**

Now there are four big reasons why Aniline users should make National their first source of supply.

QUALITY—Our Moundville Aniline is water-white, clear and exceptionally pure. It exceeds A. C. S. specifications for C. P. Aniline.

UNIFORMITY—By National Aniline's continuous hydrogenation process. Absolute uniformity is assured by automatic instrumentation.

DEPENDABLE SUPPLY—Recently doubled capacity provides an ample supply to meet the demands of quality-minded Aniline users.

PROMPT DELIVERY—From our strategic location on the Ohio River just south of Wheeling, West Va., we make fast shipments by rail, truck or inland waterway.

We will be pleased to furnish samples, specifications, price and delivery quotations.

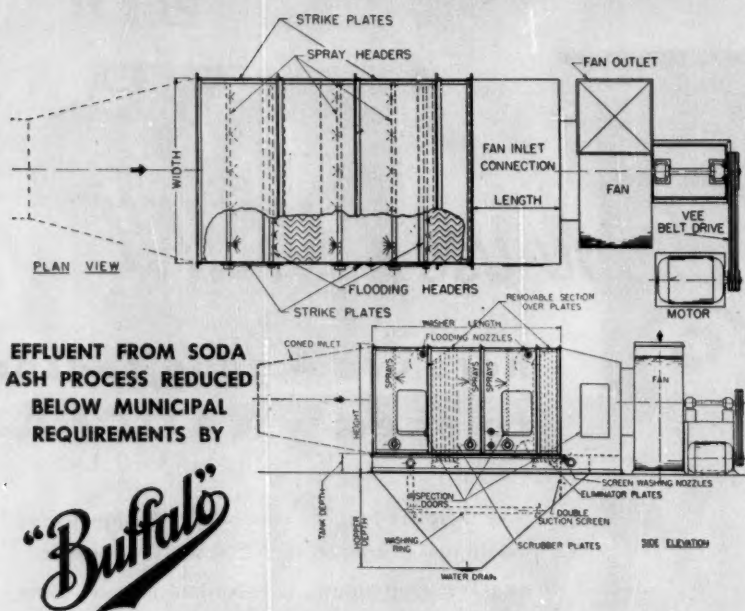
NATIONAL ANILINE DIVISION

ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

Akron Atlanta Boston Charlotte Chattanooga Chicago
Columbus, Ga. Greensboro Los Angeles New Orleans Philadelphia
Portland, Ore. Providence Richmond San Francisco Toronto



AIR CLEANING IN THE PROCESS INDUSTRIES



EFFLUENT FROM SODA ASH PROCESS REDUCED BELOW MUNICIPAL REQUIREMENTS BY

"Buffalo"

PROBLEM: Exhaust gases from the manufacture of soda ash contained from 4 to 6 grains of salt per cubic foot of gas. Municipal regulations required a concentration of no more than .4 gr./cu. ft.

SOLUTION: A "Buffalo" TE Static Washer of 30,000 cfm capacity using recirculated water was selected. This unit, using triple banks of spray-wetted eliminator plates, does an efficient removal job with overall resistance of only .75 inches water gage. Low initial cost, low maintenance cost and constant performance as rated, made this "Buffalo" Static Washer the logical choice. Also, the unit is capable of handling higher concentrations, if desired.

RESULT: Tests showed the exhaust gases contained less than .4 grains per cubic foot (a cleaning efficiency exceeding 90%), thereby more than meeting municipal requirements for the effluent. More than five installations have been made for the same company.

WHAT IS YOUR CLEANING PROBLEM? "Buffalo" Engineers, air cleaning equipment and vast experience are ready to help you. Call on the trained "Buffalo" Engineer in any principal city for results like the above and countless other installations.



VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING
FORCED DRAFT COOLING HEATING PRESSURE BLOWING

OPINION

even that of the largest corporation. That is one of the real reasons why many of the Russian periodicals are not readily available from public and private libraries. They simply cannot afford to buy all the Russian technical information that is readily available, and at a very low unit cost, compared with prices paid for English-language books and journals. . . .

Any researcher interested in English translations of current Russian scientific, and especially chemical, literature may receive our periodically published lists of translations free of charge. . . .

LEON JACOLEV
Technical Director
Associated Technical Services
East Orange, N.J.

As Reader Jacolev points out, much of the Russian literature is available—but not in usable form. As he also points out, we need "competent specialists to evaluate, translate and assimilate the available information."—Ed.

MEETINGS

American Assn. for the Advancement of Science, 123rd meeting, Statler Hotel, New York, Dec. 26-31.

American Institute of Mining, Metallurgical and Petroleum Engineers, Inc., Engineers Joint Council, Statler Hotel, New York, Jan. 17-18; annual meeting, Hotels Roosevelt and Jung, New Orleans, Feb. 24-28.

Society of Plastics Engineers, annual technical conference, Sheraton-Jefferson Hotel, St. Louis, Mo., Jan. 16-18.

Chemical Buyers' Group—National Assn. of Purchasing Agents, midwinter meetings, Western division, Congress Hotel, Chicago, Jan. 24; Eastern meeting, Hotel Commodore, Jan. 29.

Assn. of American Soap and Glycerine Producers, annual convention, Waldorf-Astoria Hotel, New York, Jan. 23-25.

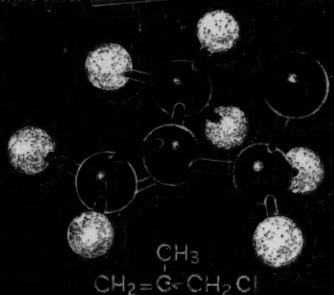
Texas A&M College, 12th annual symposium on instrumentation for the process industries, College Station, Tex., Jan. 23-25.

Society of the Plastics Industry, Inc., 12th annual Reinforced Plastics Division Conference, Edgewater Beach Hotel, Chicago, Feb. 5-7.

Chemical Market Research Assn., Sheraton Hotel, Philadelphia, Feb. 19-20.

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Penn-Sheraton Hotel, Pittsburgh, Pa., March 4-8.

FMC ORGANICS



*Methallyl
Chloride*

RECENT developments at FMC have brought methallyl chloride from test tube to tonnage within one year. We now offer you this promising compound in commercial quantities at reasonably low cost — not as a chemical curiosity, but as a useful raw material.

Chemical Reactivity

In metathesis reactions chlorine is readily replaced to form methallyl alcohol, methallyl ethers, esters, amines and other characteristic allylic derivatives. In reactions involving the double bond, the tertiary carbon atom increases the susceptibility of the double bond to halogenation, sulfonation, nitration, hydrohalogenation, halohydrin and oxidation. This enhanced double-bond activity is a characteristic of the methallyl derivatives generally. The double bond is also active in polymerization reactions.

Dependable Supply

An integrated plant, devoted exclusively to the production of this versatile chloride, is on-stream and ready to meet your requirements. Drum quantities are shipped from stock — tank-car quantities are available from production at our Baltimore plant as required.

Lower Cost

Improved processing and increased volume have already enabled FMC to reduce the price of methallyl chloride by more than 50%. We anticipate further reduction as large-scale uses develop.

Suggested Uses

Interesting applications indicated for methallyl chloride include:

monomers	fungicides
co-polymers	fumigants
insecticides	pharmaceuticals
aromatic chemicals	

Derivatives

We have acquired considerable experience in the chemistry of methallyl compounds. Numerous derivatives have been synthesized in our laboratories in Baltimore, including methallyl alcohol and methallyl acetate.

Write For Complete Information

Production samples of methallyl chloride, as well as development samples of methallyl alcohol and acetate, are immediately available. We will be glad to discuss your interest in these compounds or in other methallyl derivatives. Upon request, we'll also send you a copy of our informative bulletin "Methallyl Chloride."

fmc

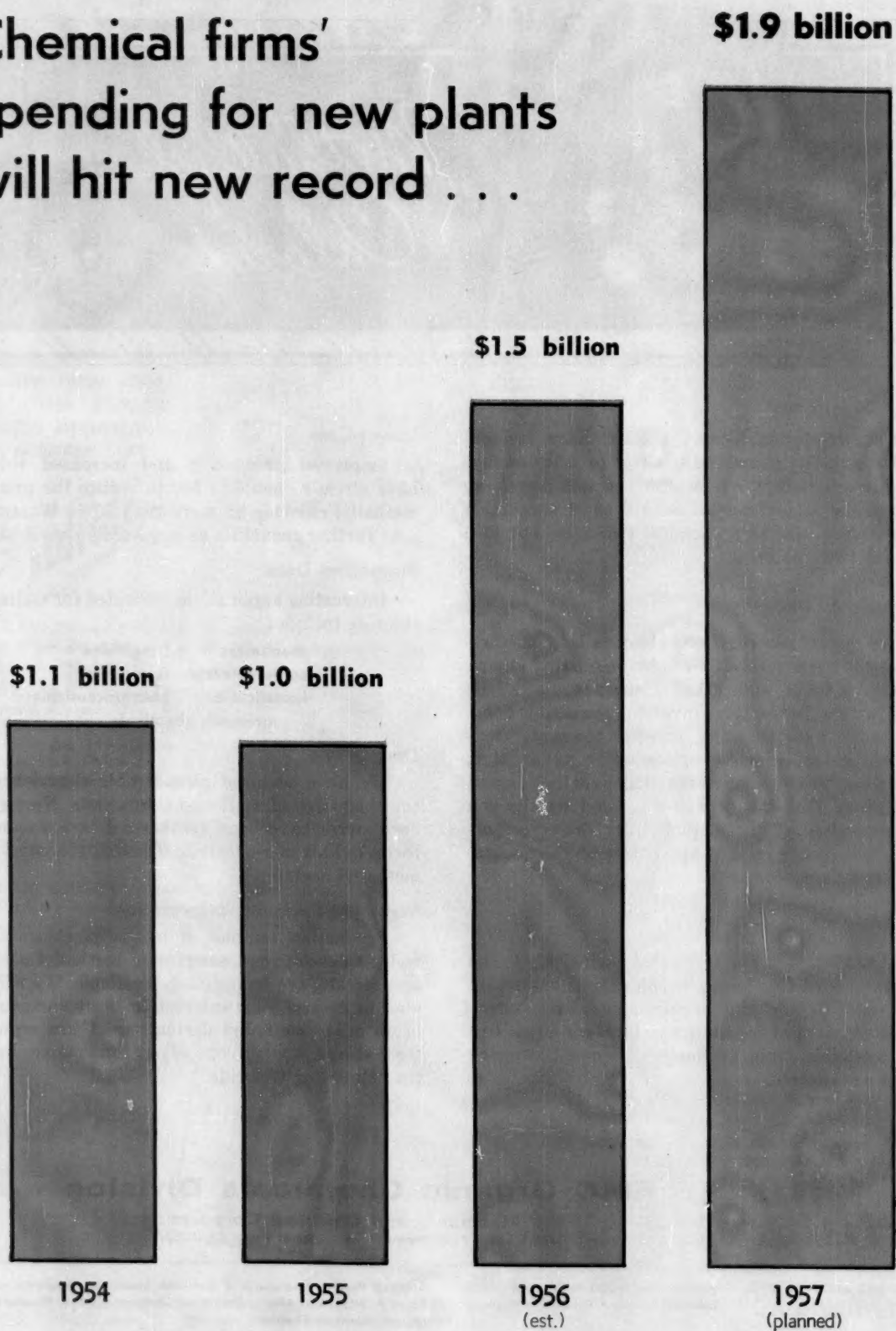
FMC Organic Chemicals Division

Food Machinery and Chemical Corporation
161 East 42nd Street • New York 17, N. Y.

chemicals

Also include: BECCO Peroxygen Chemicals • FAIRFIELD Pesticide Compounds • NIAGARA Insecticides, Fungicides and Industrial Sulphur • OHIO-APEX Plasticizers and Resins • WESTVACO Alkalies, Chlorinated Chemicals, Carbon, Phosphates, Barium and Magnesium Chemicals

Chemical firms' spending for new plants will hit new record . . .



... as process firms outpace all-industry

	1955	1956 (est.)	1957 (planned)
	(million dollars)		
Chemicals	\$ 1,016	\$ 1,469	\$ 1,895, up 29%
Paper	518	808	978, up 21%
Rubber	150	193	193, no change
Cement, glass, clay	498	688	663, down 4%
Petroleum refining	704	676	1,014, up 50%
Nonferrous metals	293	589	937, up 59%
Textiles	366	451	414, down 8%
Process industries total	3,545	4,873	6,094, up 25%
Manufacturing total	9,440	12,647	14,434, up 14%
All business total	30,030	36,261	40,236, up 11%

A High, Stable Rate of Spending

The chemical industry will set a new record for capital expenditures in 1957—nearly 30% more is scheduled to be spent during the year than has ever been spent in a year for new plants and equipment.

Process industry spending will increase, too—and show almost as spectacular a rise.

IN 1957, the chemical industry will again outshine all industry and business in general in its planned increase in spending for new plants and equipment. This is the highlight of this week's semiannual survey of business plans for capital spending, conducted by the McGraw-Hill Dept. of Economics.

The increase, shown on the chart and in the figures above, will push industry spending to a new record level in '57. What's ahead for '58? Of the companies surveyed—which employ

64% of all workers in the chemical industry—26% have preliminary plans to increase their capital spending; 37% say their spending will stay at approximately the same level. The remaining 37% say they tentatively plan to spend less.

However, money allocations for planned plants go up as the time of actual spending draws closer. Chemical industry plans for '57, reported only seven months ago (*CW*, May 19, p. 16), were \$1,576 million. The current plans to spend \$1,895 million in

1957 is a 20% increase over this.

Industry Comparison: As usual, the chemical industry far outpaced all business in increasing its rate of new plant spending. Where the chemical increase in '56 over '55 was 45%, all business showed a 21% gain. In planned spending for '57, the expectation of chemical firms that they'll increase spending by 29% is well above the 11% gain anticipated by all business.

Obviously, however, both for chemicals and for business in general, the rate of increase is slowing down. (But who could expect that the current year's spectacular rates could go on indefinitely?) There's no reason to believe, however, that expenditures won't continue to stay at a high level.

For business in general, there has been a steady trimming back of esti-

How much will plant and equipment costs go up in '57?

	Expected change in plant / equipment costs, 1957 over '56	Real-dollar change in capital spending, 1957 over '56
Chemicals	up 6%	up 22%
Paper	up 7%	up 13%
Rubber	up 6%	down 6%
Cement, glass, clay	up 7%	down 10%
Petroleum industry*	up 6%	up 2%
Nonferrous metals	up 10%	up 45%
Iron and steel	up 8%	up 22%
Textiles	up 7%	down 14%
Process industries	up 6%	up 18%
All manufacturing	up 7%	up 7%
All business	up 6%	up 5%

*Includes exploration, and other parts of petroleum industry in addition to refining; figures are not comparable to refining figures on p. 29. The petroleum industry as a whole in 1957 will spend 8% more for new plants and equipment than in '56.

mates for capital spending this year. In June, business intentions, as reported to the federal government's Securities & Exchange Commission and Dept. of Commerce, pointed to over-all new plant spending of \$35.7 billion in 1956. The next survey by the government agencies—in September—lopped \$400 million off the estimate; their December survey, completed last week, knocks off another \$400 million. McGraw-Hill's figure is higher than any of these.

Why have there been these 1956 cutbacks? The big reason is probably steel. Many industries' expansion programs have been suffering from lack of steel since last summer's strike, with no indication that relief is in sight.

Steel Shortages: It's debatable how bad the shortage of steel is for various process industries. For those who use heavy plate steel, it may get acute.

To relieve shortages of capacity, steelmakers will spend \$1.66 billion for new plants in '57.

Of course, steel shortages aren't the only reasons for spending cutbacks.

Such factors as the present "tight money" situation and rising costs are

in the picture, too. However, these are troubles businessmen must expect to have when trying to expand on top of a two-year boom.

But chemicals have bucked all industry's 1956 cutback trend. The total that chemical firms planned to spend, as shown by the SEC-Commerce surveys, has risen from \$1,426 million in March to \$1,468 million in December. (This figure is in striking agreement with the McGraw-Hill 1956 figure—\$1,469 million—which was projected from a smaller survey sample.)

Price Inflation? Of course, some of the increase shown in the figures for 1956 spending represents inflation caused by higher equipment costs. Such price rises were based, in many cases, by the round of steel industry wage and price increases.

But such increases affected five months of activity at the most. New plant construction in '57 will be affected both by past increases, and by others still in the cards. How much will the increase be? The chart (above) shows process industry thinking. And even when you take the inflation factor into account, planned increases in capacity are substantial.

They are large enough, in fact, that parts of them may have to be carried over into 1958—both from the standpoint of availability of the necessary steel and equipment and from the point of view of finance. There may be just too much expansion planned to be paid for from internal company funds and from the money available at attractive interest rates from banks and in the securities market.

Increase Means Decrease: For some industries shown in the table (above), the estimates of higher costs mean an actual slowdown in adding to physical capacity.

But other increases generally indicate a leveling at a plateau, not a sign of an impending economic downturn.

In Washington, there's no talk of relaxation of present monetary policies (established to curb further inflation). Officials there won't start worrying until there's some sign that business is canceling expansion plans because of lessened confidence in the future—and nothing of that kind is coming through to the official listening posts.

Everything in Washington points to further gains in '57 for capital spending—and just about everything else.

Tuscola's Complex

A new chemical complex will spring up at Tuscola, Ill., soon if Godfrey L. Cabot, Inc.'s, Cabot Carbon Co. subsidiary picks up its options on 75 acres adjacent to the U.S. Industrial Chemicals and National-Petro Chemical plants there.

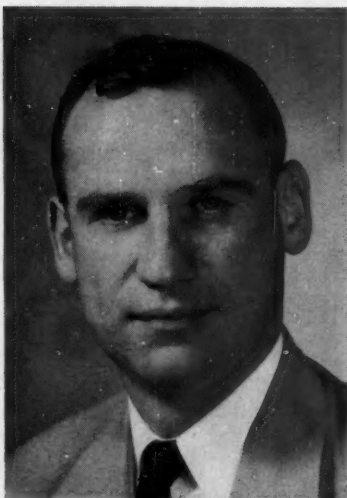
Cabot is "99% sure" to pick up the options, would use 40 acres for a silicon dioxide unit that would be integrated with USI's ammonia plant and National's ethyl chloride facility. The remaining acreage leaves room for expansion. Possible uses: to produce "metallic oxide" products.

Integrated Process: Cabot will presumably use the German Degussa high-temperature vapor-phase reaction to make a finely divided form of dioxide — its so-called "white carbon black," Cab-O-Sil. For feedstock, it will get oxygen by-product from USI's ammonia plant's air separation unit. It will also use some by-product hydrogen that USI purifies from a by-product steam from National's ethylene cracker. Cabot will use both hydrogen and chlorine in its process, will get by-product hydrochloric acid, which it will pipe back to National's ethyl chloride unit. In addition, Cabot will get steam and water from USI.

Cabot would be the fourth chemical firm at Tuscola. After construction of a plant by National—60% owned by National Distillers—USI, a wholly owned Distillers' subsidiary, built a sulfuric acid and denatured alcohol plant there. USI will start construction soon on a phosphoric acid plant. Also attracted to Tuscola: Illinois Farm Supply Co., which makes fertilizers there.

Imports No Longer: Until now, Cabot has been importing its silicon dioxide from Germany and processing it here to sell under its Cab-O-Sil trademark. Now, the company figures there's enough demand for the specialty reinforcing agent to warrant production in this country. Moreover, Cabot will use a process largely ignored by other domestic producers, who've concentrated largely on liquid-phase manufacture.

Though cost and capacity figures aren't yet revealed, Cabot will say that the plant is to employ 50 to 75 people. Construction, if weather permits, will begin as soon as possible after the options are picked up.



O'NEIL: He reports a trend to external sale of . . .

General's Chemicals

General Tire & Rubber Co. will shift more and more emphasis onto its external chemical sales.

It will spend about \$10 million in 1957 to expand its chemical division and will probably soon plunge even further into the field, either by acquiring a going chemical company, or via a joint petrochemical venture with a large oil company.

These were the paths outlined by Gerald O'Neil, General's executive assistant to the president, in a talk before the N.Y. Society of Security Analysts last week. Though he indicated that outright purchase of a chemical company was the easiest way to go about becoming chemical, there was a good possibility of starting a joint enterprise with a petroleum company. "The choice hasn't been made yet," says O'Neil, "since, as you know, either would take a lot of money. We've still got to do some more thinking on it."

General is one of the world's largest producers of plastic film, also makes glass laminates, foams and the like. Thus, its plastics division, which makes up approximately 25% of the company, is a prime candidate for further vertical integration. "Actually, if you overlook RKO studios, which we just recently acquired, our business is already largely one of chemical processes," O'Neil pointed out. He amplified this by explaining that tires and tubes, end-use products of the firm's

chemical processes, should account for 40% of sales this year.

Missile Makers: Rocket-making Aerojet-General, by far the fastest-growing segment of the firm, employs the second-largest number of chemists on the West Coast. Its sales are expected to double this year, putting it in position to snare about 35% of General's sales this year. The firm, known for research and development of defense rocket materials, expects actual production—as opposed to research and development—to increase drastically this year.

Record Sales: O'Neil believes sales for '56 will top \$370 million—a \$75-million boost over last year. He predicts a \$425-million volume in '57.

But the profit picture is not quite so bright. General's earnings showed a substantial dip for the first nine months of '56; and though business picked up in the fourth quarter, overall profits will still not match those of last year.

The big lag in automobile output, unexpected in many quarters, cut into the company's take from sales of tires and plastics for automobiles. Moreover, keen competition in the urethane foam field also hurt profits.

Looking Ahead: The future looks encouraging, General thinks. Commenting that the company had expanded its polyvinyl chloride resin plant at Ashtabula, O., 50%, and that further expansion there was already blueprinted for '57, O'Neil added:

"This coming year will see full integration of our plastics division, with Ashtabula as prime source of raw material. We expect this integration to lead us more and more into external chemical sales."

EXPANSION

Caustic Soda: Canadian Industries Ltd. will expand by 30% its caustic soda capacity at Shawinigan Falls, Que., by installing an anhydrous caustic concentrator, which will enable the plant to produce at least 15,000 tons/year. Completion is slated for late '57.

Pharmaceuticals: Eli Lilly and Co. will install \$2 million worth of antibiotic fermentation facilities at Lafayette, Ind.—expanding capacity 50%.

• Abbott Laboratories Ltd. is expanding pharmaceutical production at

Washington Angles »

» **Another try at selling the Louisville rubber plant** is being planned by Treasury officials. They're wasting no time seeking Administration clearance to get Congress to sell the idle, 90,000-tons/year butadiene-from-alcohol plant next year. Last week, they won support from Defense Mobilizer Flemming to seek legislation allowing sale of the plant for general chemical manufacture—just in case present negotiations, closing Saturday, Dec. 15, fail to turn up an acceptable long-term lease deal. Treasury's Federal Facilities Corp. has been dickering for weeks with Union Carbide and Publicker Industries—each of which had bid on the 5- to 15-year offer.

» **Efforts to sell the Texas City tin smelter** are going ahead. Speculation that FFC's negotiations have flopped got going on reports of layoffs and production cuts preparatory to full shutdown Jan. 31, when the law authorizing operation of the plant expires. FFC says a gradual tapering of production is normal under such circumstances; and privately, officials are optimistic over chances of selling the plant before Jan. 31 to either the Wah Chang Corp.—a major tungsten outfit—or a still unidentified California group. And, if negotiations ending Dec. 27 fail to pan out with these bidders,

his aides expect Senate Majority Leader Lyndon Johnson of Texas to ask Congress for an eleventh-hour reprieve to prevent dismantling of the plant.

» **A chemical executive carried the ball** for all industry in last week's effort to talk Congress into ending the World War II excises on transportation. Donald G. Ward, assistant vice-president of Olin Mathieson, told a House Ways & Means subcommittee that the imposts are a "deterrent to public transport" and a discriminatory burden on all shippers and travelers. Testifying as chairman of National Conference for Repeal of Taxes on Transportation, Ward said business shelled out \$487 million extra for freight movements this year in paying the 3% levy on goods shipped by common carrier, plus millions more under separate imposts for oil pipeline and coal shipments.

Because of the heavy revenue loss involved, bets favor Congress continuing the transportation taxes next year.

» **The future of plastics and rubber** for military applications was explored by 350 Pentagon and industry production and research experts this week. Open only to security-cleared (by the Pentagon) industrialists, the "classified-confidential" meeting was sponsored by the National Industrial Security Assn., a group of business firms holding defense contracts. NISA hopes to have an expurgated version of the reports available for non-members in about a month.

Mount Royal, Que., with a \$100,000 addition to its present facilities.

• Smith, Kline & French Laboratories will build a 7,000-sq. ft. building in Upper Merion Township, Pennsylvania, to manufacture pharmaceutical chemicals.

COMPANIES

Bunker Hill Co. (San Francisco) has purchased all the assets of Associated Lead & Zinc Co. (Seattle), formerly owned jointly by Bunker Hill and Eagle-Picher Co. The new acquisition will be operated as the chemical products division of Bunker.

• **Chemway Corp.** has acquired Carac Corp., makers of agricultural chemicals.

• **Scovill Mfg. Co.**, processors of non-ferrous metals and alloys, will make a public offering of \$15 million of common stock and debenture issues. Common stock will be offered to present stockholders on the basis of one share

for each eight held. Proceeds will be used for expansion and modernization.

FOREIGN

• **Petrochemicals/Germany:** The German firm, Rheinische Olefinwerke, will hike production of high-pressure polyethylene and styrene monomer at its Wesseling plant from 10,000 tons/year to 30,000-35,000 tons/year by 1958. Cost of the expansion: \$33.3 million.

• **Synthetic Fibers/Japan:** Two Japanese firms are negotiating with Imperial Chemical Industries for 11-year licenses to produce Terylene. The two, Toyo Rayon and Teikoku Rayon, hope to start turning out 5 tons/day of the fiber by April '58.

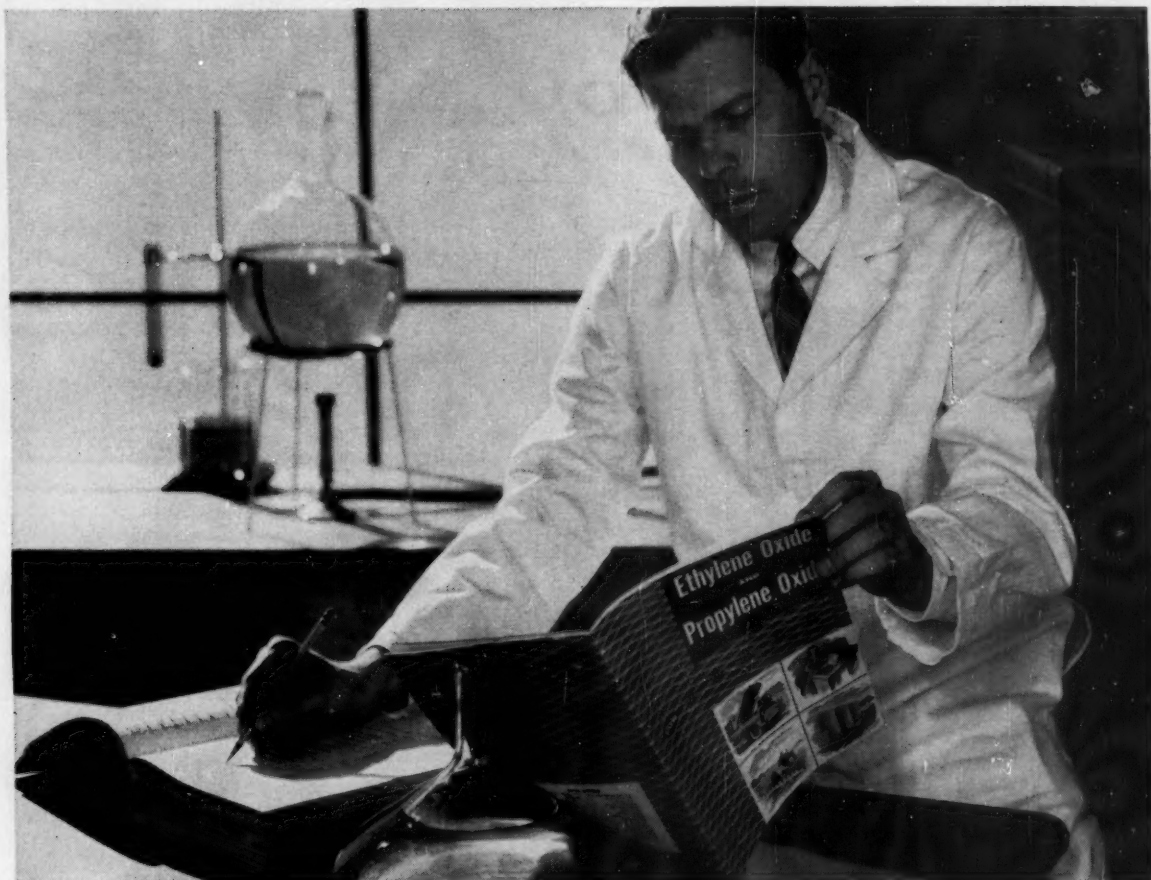
• **Synthetic Rubber/India:** New installations for production of synthetic rubber components will be set up in Uttar Pradesh and Rourkela. To make butadiene, the Pradesh plant will use

alcohol available from sugar factories in the area. Coke-oven gases will provide starting materials for the Rourkela styrene operation. At least three U.S. companies may bid on the project.

• **Peroxide/France:** The French firms, Air Liquide and Ugine, have just formed a jointly owned company for making hydrogen peroxide. The new firm, Oxysynthese, is capitalized at \$250,000 and will reportedly use a new manufacturing process.

• **Drugs/Argentina:** Restrictions on drug imports to Argentina have been eased by a new trade law that eliminates Argentina's strict import quotas. First firm to be granted a license under the revised system is Sterling Drug Co.

• **Alkylate/Britain:** Shell Chemical Co. (London) has just completed a new 30,000-tons/year alkylate plant as part of its Shell Haven refinery in Essex. Cost: \$4.5 million.



You'll want to refer to it often

*New Dow booklet on ETHYLENE and PROPYLENE OXIDES
puts helpful data at your finger tips*

CONTENTS: Reactions — Specifications — Properties — Densities—Vapor Pressures—Explosive Mixtures—Storage —and other valuable information to assist you in the handling and use of these versatile alkylene oxides.

Versatility has already established the use of ethylene and propylene oxides in many products and industries. Still, many products now in experimental stages promise an ever increasing demand for these clear, colorless liquids.

To meet this need—both in supply and technical assistance—the extensive Dow tank-car fleet is geared for prompt delivery to every locality in the nation. And the Dow Technical Staff, with its modern research facilities, is always available.

It will pay you to call Dow . . . and to have our new booklet on ethylene and propylene oxides. Get your copy by mailing the attached coupon. You'll want to refer to it often!

THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. OC8448-1
Please send booklet on ethylene and propylene oxides to:

Name _____
Title _____
Company _____
Street _____
City _____ State _____

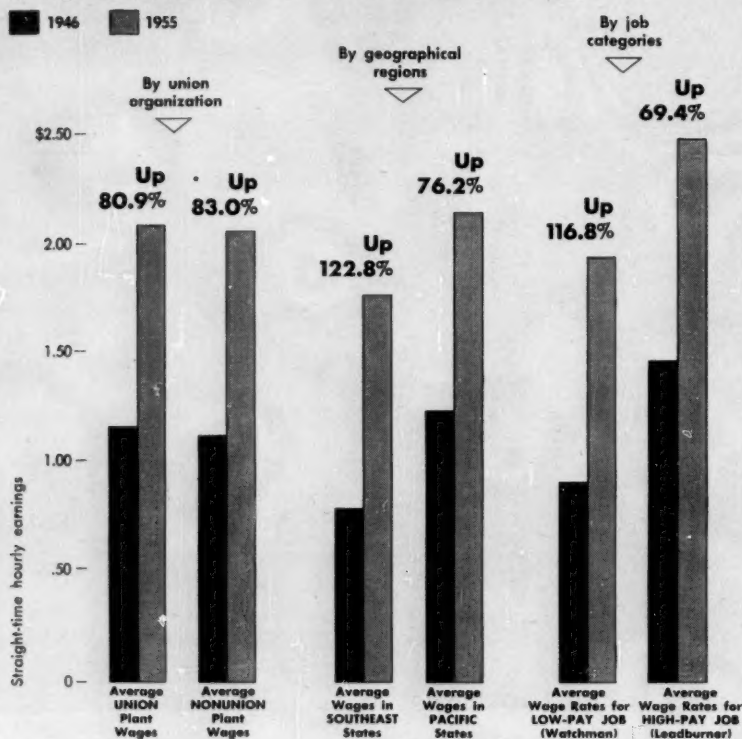
you can depend on DOW CHEMICALS

DOW

ADMINISTRATION

Wage Trend: Valleys Gaining on the Peaks

Earnings in Industrial Chemicals: The Trend Is Toward 'Leveling'



THREE POLLS ON WAGE PRACTICES

(Highlights from reports by U.S. Bureau of Labor Statistics on wage structure in industrial chemicals plants)

	Jan. '46†	Oct.-Nov. '51‡	Aug. '55‡
Establishments surveyed	255 of 414	244 of 596	309 of 628
Employees covered	83,114 of 95,040	69,655 of 182,910	153,647 of 215,959
Average straight-time hourly earnings ⁽¹⁾ :			
All categories	\$1.14	\$1.69*	\$2.07
Men	1.15	—	2.08
Women	0.96	—	1.61
In small plants ⁽²⁾	1.04*	1.61*	1.92
In large plants	1.22*	1.75*	2.14
In small communities ⁽³⁾	1.19*	—	2.13
In large communities	1.09*	—	2.02

(†) Plants with 8 or more employees.

(‡) Plants with 21 or more employees.

* Estimates, based on data and statements in BLS reports.

(1) Excluding premium pay for overtime, weekends and holidays.

(2) "Small plants" are those with fewer than 500 employees.

(3) "Small communities" are those with population less than 100,000.

WHILE the whole plateau of industrial chemical wage rates has been rising rapidly over the past decade, the uplift has been more pronounced in the valleys than on the peaks.

This leveling-out process has been acting on long-established differentials based on geographical regions, job categories, and—much to the annoyance of the chemical labor unions—union status of plant personnel.

Latest data on this trend comes from a Bureau of Labor Statistics survey that may serve as the basis for a new determination of this industry's minimum wage rate under the Walsh-Healey public contracts law (CW, Nov. 17, p. 36). It shows that various wage differentials that loomed large 10 years ago have shrunk greatly.

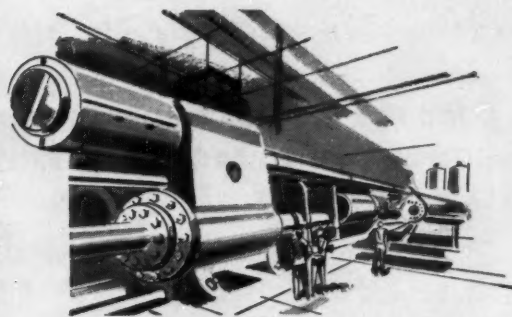
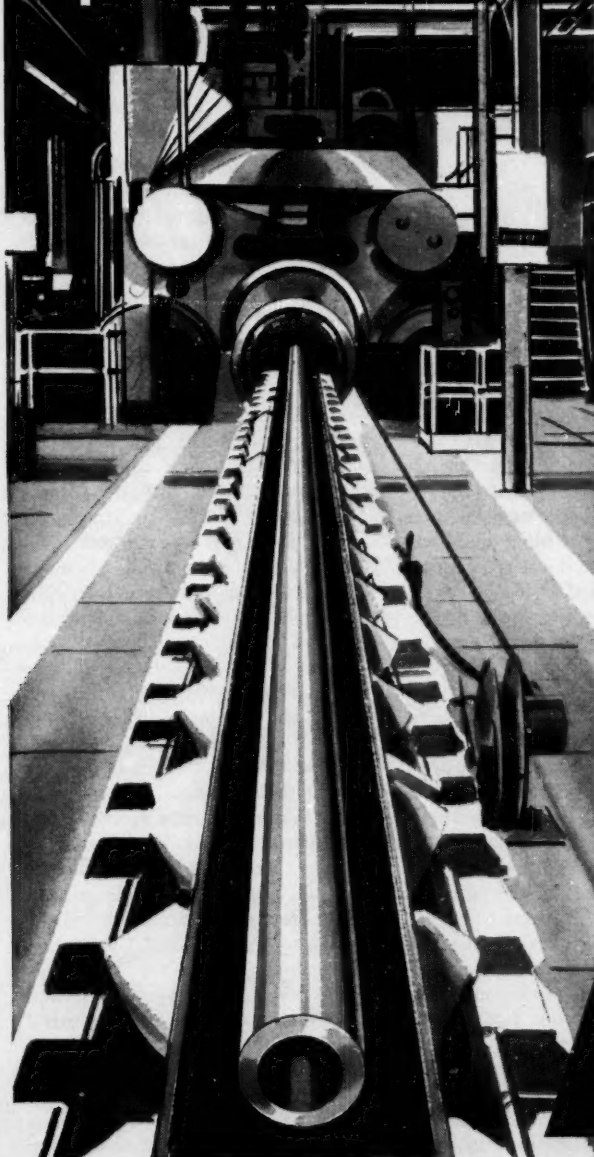
Gaps Are Narrowed: For example, the first BLS wage structure survey in the industrial chemicals industry, made in early '46, indicated that average straight-time hourly earnings in unionized plants were about 3% higher than in nonunion plants; but by Aug. '55—when the latest survey was made—this gap had narrowed to less than 1.5% (see chart).

Similarly, the 1946 West Coast wage average was 54.4% higher than the average in the Southeast; but by '55, this discrepancy was down to 22.2%. The wage differential between certain high-pay and low-pay jobs was 63.4% in '46, but had dropped to 27.7% by '55.

In two other comparisons, wage gaps have become relatively smaller even though the actual cents-per-hour differences have increased slightly (see table). The big-plant wage margin shrank from 17.3% to 11.5%, and the small community edge in pay rates slipped from 9.2% to 5.4%.

Since this latest report tends to weaken labor unions' organizing theme—that unionization brings substantially higher wages—they have been suggesting that BLS may have erred in its surveying methods—particularly in its sampling base. However, the survey appears to be in close accord with BLS monthly wage data, which the unions accept without challenge.

**For longer life,
higher performance
in the petroleum,
chemical and
power industries**




Corrosion-Resistant, Heat-Resistant EXTRUDED Steel Pipe

Curtiss-Wright's Metals Processing Division now offers the petroleum, petrochemical and power industries a line of high-quality, extruded steel tubular products to meet the most severe demands of modern processing. Inherent corrosion and heat-resistant properties of the steel alloys used are amplified by extrusion because the finished tube is produced with only one heat, in one pass of the giant 12,000 ton press . . . formed under compression in a matter of seconds without seams, in lengths up to 50 feet. Extra margins of resistance to corrosion and heat are built in easily by extruding heavier pipe wall thicknesses at no sacrifice in production speed. The most up-to-date quality control facilities, including **ULTRASONIC TESTING**, are employed in production.

Curtiss-Wright's extrusion facility is a specialty mill, ideally equipped for the production of special purpose, premium quality tubing. Conformance to A.S.T.M. specifications and other exacting standards is assured by an experienced engineering staff and the most modern metallurgical testing equipment.

When higher pressures and temperatures, or more corrosive service conditions demand more than the ordinary in large diameter pipe, let Curtiss-Wright serve you through the nearest Metals Processing Division Branch Office, or write to the Main Office address shown below.

79 Grider Street, Buffalo, New York

METALS PROCESSING DIVISION
CURTISS-WRIGHT 
CORPORATION • BUFFALO, NEW YORK

ELECTRONICS • NUCLEONICS • PLASTICS • METALLURGY • ULTRASONICS • AVIATION

LOOK FOR CANADA'S ROYAL PATENT COMMISSION TO BACK THESE EXISTING PATENT LAW PROVISIONS . . .

- Patentees must manufacture in Canada within three years after receiving a Canadian patent.
- Food and medicinal patentees must make their patents available for licensing at government-established royalty rates.
- Patents receive protection for 17 years.

. . . AND THERE'S AN OUTSIDE CHANCE THESE CHANGES WILL BE SUGGESTED:

- Prepatent examination should be simplified and shortened.
- Compulsory licensing should be extended to all patents covering inventions considered "essential to human sustenance and health."

Weaker Patents Pending

U.S. manufacturers may soon find their Canadian patents are receiving a good deal less protection than before, and, oddly enough, they will be able to say little about it.

Canada's Ilsley Royal Commission—headed by Judge J. L. Ilsley—will soon make a report on the findings of its comprehensive investigation of Canada's patent system, and some U.S. manufacturers are registering concern that the report may suggest some sweeping changes (*see table*). This concern, say some Canadians, is a bit belated, since whatever suggestions the commission may make will be the result of earlier hearings in which U.S. representation was noticeably lacking.

One outspoken critic of the lack of U.S. attention to the patent investigation is Montreal patent attorney Alan Swabey, president of the Patent Institute of Canada. Swabey warns of "antipatent" sentiment in Canada, which, he explains, is working to "water down" the present patent system. The Patent Institute head told *CW*, "It's the age-old struggle between the haves and have nots." He went on to say there are Canadians who feel the existing, thorough prepatent examina-

tion is cumbersome and should be simplified. "Some of these same people," he added, "would like to see compulsory licensing, currently applied only to food and medicinal patents, broadened to apply to other 'essentials' such as housing and transportation." A private bill that would have accomplished this was introduced recently in Canada's House of Commons and rejected on a motion by the Secretary of State.

'Antipatent' Forces: So-called "antipatent" forces in Canada, Swabey said, include Canadian and British-owned firms and some newspapers—notably the *Regina Leader-Post* and the *Saskatoon Star-Phoenix*. Among the movement's leading spokesmen: Thurman Arnold, former assistant attorney general of the U.S. Justice Dept.'s Antitrust Division; Ian MacKeigan, former deputy commissioner under Canada's Combines Investigation Act; Walter Hamilton, former professor of law at Yale.

Those Canadians who are fighting to keep the patent law just as it is, and, if anything, to strengthen its protective qualities, include the Patent Institute of Canada, Canadian Manufac-

turers Assn., and the Chemical Institute of Canada.

R. S. Jane, president of Shawinigan Chemicals Ltd., expressed a concern shared by many chemical firms over "tampering with the basic underlying principles of our patent act. . . ." He added, "It is not obvious why the government has found it necessary or advisable to set up a Royal Commission to inquire into the operations of the Canadian Patent Act."

What effect "antipatent" testimony has had on the Royal Commission will be known shortly. Then it'll be up to the federal parliament at Ottawa to say whether Canadian patents will be easier to get and less worth having.


LEGAL

New PE Suit: Reichhold Chemicals, Inc. (White Plains, N.Y.), has tossed another sliver of kindling on its smoldering pentaerythritol (PE) litigation with Delaware Chemicals, Inc. (Wilmington), by filing a \$150,000 suit for fraud.

The suit is the fifth major development in a litigation that began Feb. 24, '55, with a \$1-million Delaware Chemicals suit charging Reichhold with violation of a contract concerning the production of pentaerythritol. Delaware Chemicals charged that Reichhold produced PE after learning the process from the plaintiff.

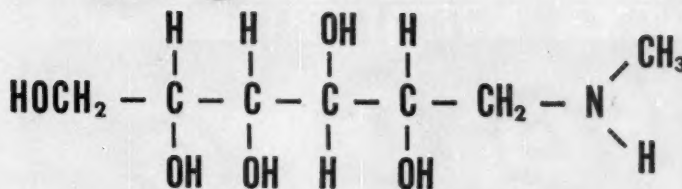
In the latest development, Reichhold alleges that Delaware Chemicals made false representations, among them that the Wilmington firm had a commercial process for the manufacture of PE, that it had a plant suitable for the manufacture of high-grade PE, and that it had the necessary skill and knowledge to manufacture the product. The suit was filed in New York state supreme court.

Less than two months ago, Chancellor Collins Seitz, in a Wilmington chancery court, gave Reichhold the right to continue using its present process for manufacture of PE by refusing to grant a blanket restriction requested by Delaware Chemicals (*CW*, Nov. 10, '56, p. 36). At that time, Chancellor Seitz also turned down two Reichhold plans for carrying out reciprocal inspection of the processes. The inspection had been ordered sometime before, but the two companies have been unable to agree on safeguards for the inspection.



If you're working on dyes,
pharmaceuticals or
surface active agents—

Consider **DU PONT**
N-Methylglucamine



A polyhydroxyamine now available in commercial quantities in a technical grade

PHYSICAL PROPERTIES

APPEARANCE:

Off-white, needle-shaped crystalline powder

MOLECULAR WEIGHT:

195.21

MELTING POINT:

128° C. Minimum

PURITY:

99% Minimum

SUGGESTED USES: Du Pont N-Methylglucamine Technical may be used as an intermediate and solubilizing agent in the preparation of many interesting and valuable products, such as:

- Surface active agents, including detergents, emulsifiers, foam builders and thickeners
- Pharmaceuticals and physiologically active compounds, salts and complexes
- Stabilized diazo compounds (used in textile dyeing and printing)

Du Pont N-Methylglucamine Technical may also be used as a printing assistant and as a stabilizer and metal deactivator in chlorine-containing polymers.

REACTIONS: In general, N-methylglucamine exhibits the characteristic reactions of aliphatic amino alcohols. For example, N-methylglucamine reacts:

With alkyl halides to produce tertiary amines

With 2-aminoethylsulfuric acid to produce aminoethylmethylglucamine

With dimethyl sulfate to produce N,N-dimethylglucamine

FOR FURTHER INFORMATION, just drop us a note. We'll be glad to send you our product information sheet and a free test sample of Du Pont N-Methylglucamine Technical if you wish. Address: E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Dept., Chemicals Division, Wilmington 98, Delaware.



BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

ORGANIC

CHEMICALS DEPARTMENT

ADMINISTRATION

LABOR

Labor Market Tighter: With chemical and other industrial employment rising this season, the U.S. Labor Dept.—basing its forecast on a recent survey of major employers—is predicting a tightening labor market through the first few months of the coming year.

Over-all, nonagricultural employment rose by 187,000 in October to a figure that was 1¼ million higher than one year ago. In chemicals and allied products, total employment dipped very slightly in October but still was 15,300 more than in Oct. '55. And though total chemical employment declined in October, there was a significant increase—1,400—in employment

of production and maintenance workers. This was in contrast with the general trend in this industry, which over the past decade or more has been using a gradually decreasing proportion of production workers.

Close Election Split: Oil, Chemical & Atomic Workers Union (AFL-CIO) has broken even in its latest chemical plant elections, both of which were decided by narrow margins. At the new plant of Allied Chemical's Barrett Division in Sunbury, Pa., OCAW squeezed through to a 53-to-50 triumph in an election contested by District 50, United Mine Workers (although UMW is not eligible to be listed on the ballots in elections con-

ducted by the National Labor Relations Board). But at Gardenville, N.Y., employees of Philadelphia Quartz Co. voted 8 to 7 to reject OCAW as collective bargaining agent.

No Wash-up Pay: Workers in explosives plants can't collect "portal-to-portal" pay for time spent in changing clothes and showering. The U.S. Supreme Court has refused to review a court of appeals decision appealed by a group of Nebraska ordnance plant employees who had sued for back wages equal to 45 minutes' overtime pay for each shift worked.

KEY CHANGES

G. L. Pitzer, to vice-president, production; **C. W. Blount**, to vice-president, marketing; and **J. D. Benedito**, to vice-president, sales; Bakelite Co., division of Union Carbide and Carbon (New York).

James M. Phelan, to board chairman and president, Nuclear-Chicago Corp. (Chicago).

Chalmer G. Kirkbride, to executive director, Research, Patent and Engineering Depts., Sun Oil (Philadelphia).

C. B. Mills, to board chairman, and **P. C. Williams**, to president and treasurer, O. M. Scott & Sons (New York), garden chemical manufacturers.

James W. Hutchison, to vice-president in charge of reduction, Olin Revere Metals Corp. (New York).

W. Cooper Willits, to assistant to the president, Pennsalt Chemicals, subsidiary of Pennsylvania Salt Mfg. Co. (Philadelphia).

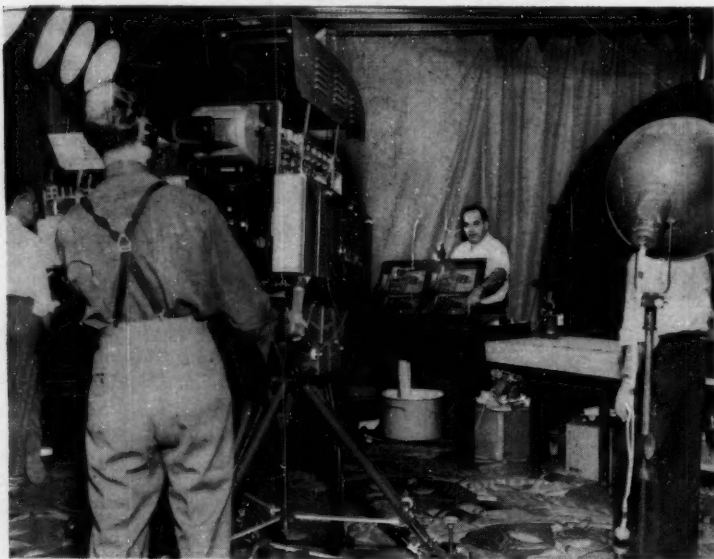
James P. Vandervort, to assistant to the president; and **Thomas F. Parks**, to assistant to the vice-president and general sales manager, Chemstrand Corp. (Decatur, Ala.).

Vernon A. Bellman to director, Scony Mobil Oil (New York).

A. G. Schei, to vice-president, finance, Shell Oil (New York).

RETIRED

John R. McConnell, vice-president, American Air Filter Co., Inc. (Louisville, Ky.).

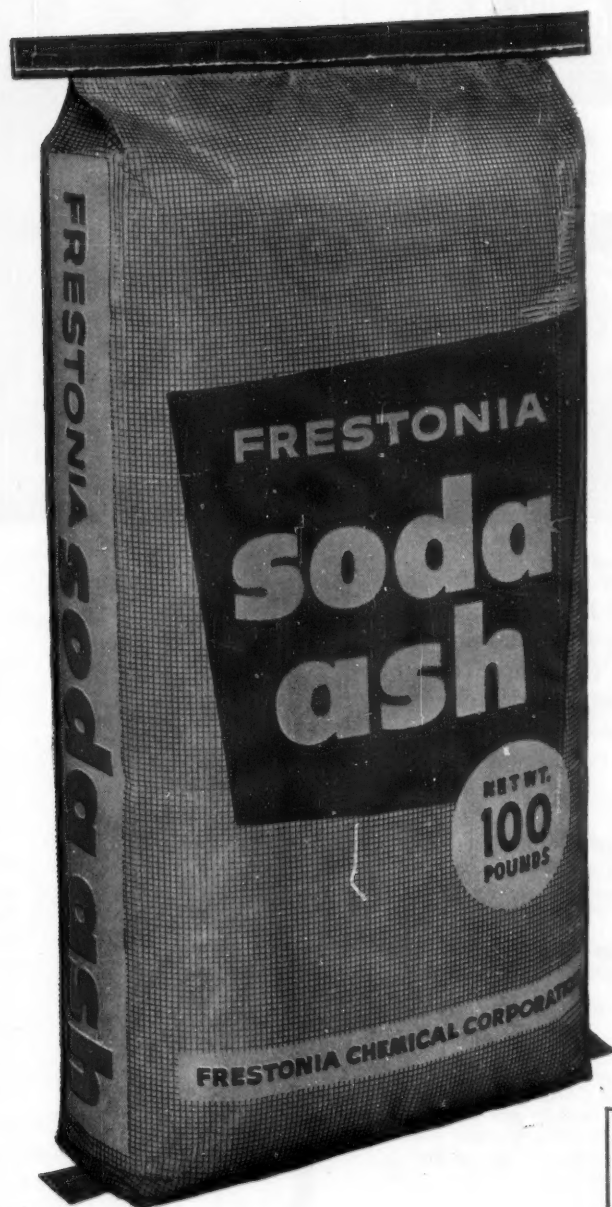


TV Helps 'Sell' Automation

MELTING employees' resistance to automation and other modernized production methods can be a chemical company's problem in two ways: within the company itself and in its customers' plants. This month, a number of chemical process companies—through the Lithographic Technical Foundation, Inc., which they sponsor—have been tackling this problem with closed-circuit TV presentations to joint labor-management audiences. Such a program might be applicable to both internal

and customer phases of the problem; but in this case, it's being used for the latter. Lithography employers and employees attending "lithographic technical progress forums" in Chicago, New York and other cities are seeing televised demonstrations of latest lithographic techniques, using new chemical and photographic materials and equipment. Theme is "Know-how pays off—for all"; and the lithographers' union now states that "We don't fear progress, we welcome it."

FOR YOUR **MULTIWALL** SHIPPING SACKS



THE

IMPRESSION OF COLOR WITHOUT ITS COST

**New Union Uni-color printing
saves up to \$6 per M**

You get the effect of a colored outer sheet. Actually, the stock is natural color, printed with Union's new Uni-color process. You save the cost of a colored outer ply, or all-over printing. You also achieve the appearance of a two-color design, using only one color.

Send for samples. Better still, ask to see how this economical and effective design treatment can be used on your multiwalls.

UNION'S 5-POINT MULTIWALL EFFICIENCY PLAN saves you money, helps you get better packaging performance. Includes analysis of design, equipment, construction; specification control; plant survey. Ask for details.

**Better Multiwall Performance
Through Better
Planning**



UNION MULTIWALL BAGS

UNION BAG-CAMP PAPER CORPORATION

233 BROADWAY, NEW YORK 7, N. Y.

For liquid detergent formulations

try the raw material with the world's best references

NEOLENE 400

Neolene 400 is an established high-quality hydrocarbon that has earned a key position, not only with the world's foremost processors, but also with smaller compounders everywhere. Sulfonates produced from Neolene 400 are particularly well suited for compounding in liquid formulations. Latest sulfonation method, using SO_3 with Neolene 400, contributes to quality and production efficiency in liquid formulations. This procedure does away with handling, storing and disposing of spent sulfuric acid.

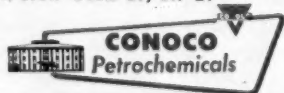
In addition to Neolene 400, you can count on Conoco for:

WATER-SOLUBLE SULFONATES—produced from Neolene 400. Available as sulfonate slurry, sulfonic acid, or in spray-dried and drum-dried forms.

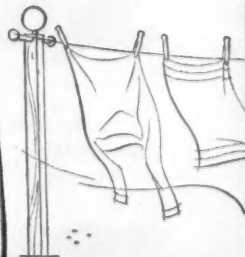
OIL-SOLUBLE SULFONATES—manufactured by sulfonation of synthetically produced hydrocarbon under closely controlled conditions.

CONOCO H-300, a secondary plasticizer for vinyls—outstanding light stability . . . improved low-temperature flexibility . . . viscosity depressant and stabilizer.

TECHNICAL ASSISTANCE—Continental Oil Company is thoroughly experienced in the manufacture and application of sulfonates. Let us help you with your particular problem. Continental Oil Company, Petrochemical Department, Division C-12, 630 Fifth Avenue, New York 20, N. Y.—1353 No. North Branch Street, Chicago, Ill.—Export: Airco Company International, 60 East 42nd Street, New York 17, N. Y.



*Petrochemical know-how
from the ground up!*



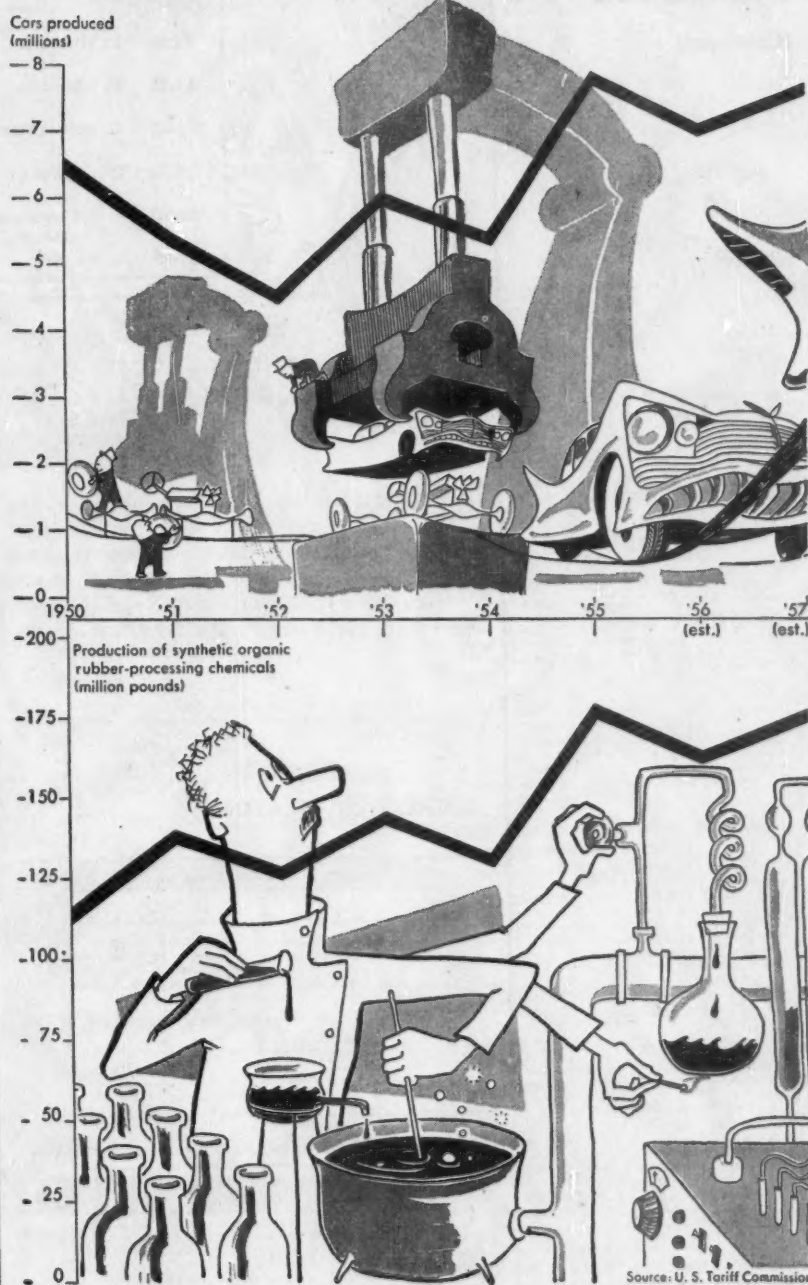
CONTINENTAL OIL COMPANY

©1956 Continental Oil Company

Charting Business

CHEMICAL WEEK
December 15, 1956

RUBBER CHEMICALS REFLECT AUTO OUTPUT



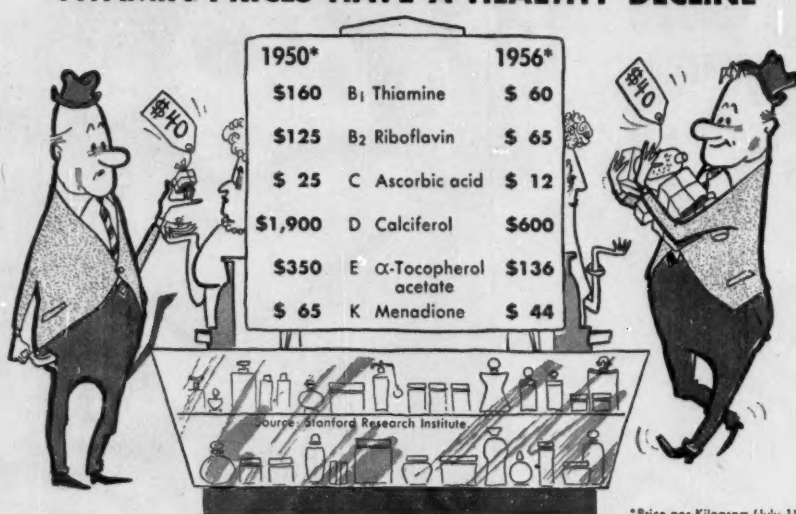
DURING the last five years, production of rubber processing chemicals has paralleled the economic fluctuation of the automobile industry. This year, total cars produced will be less than in '55, dropping from 7.8 to 7 million units. Manufacture of rubber processing chemicals will also show a

downtrend—'55, 177 million lbs.; '56, 165 million lbs. But with car production forecasts for '57 showing an increase, rubber processing chemicals should also pick up again. Today, about 48% of these synthetic organic chemicals are accelerators, 41% are anti-oxidants, and the remainder, peptizers.

Charting Business

(Continued)

VITAMIN PRICES HAVE A HEALTHY DECLINE

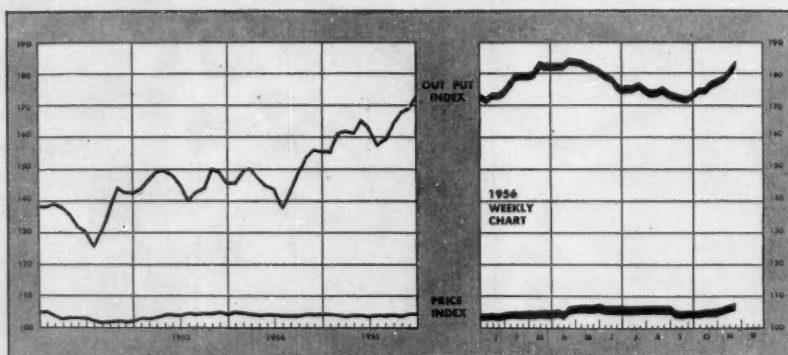


*Price per Kilogram (July 1).

VITAMIN prices have been plummeting; since 1950, some have dropped as much as 200%. Reasons: domestic producers have been hit hard by keen competition from imports, which have skyrocketed over the last five years;

increased demands have resulted in a peppy production growth (this year's output may well hit 6.9 million lbs.); over-all technical improvements have lowered the industry's manufacturing costs.

BUSINESS INDICATORS



WEEKLY

	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	186.2	184.5	171.8
Chemical Week Wholesale Price Index (1947=100)	107.6	107.2	104.7
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	436.2	409.1	479.4

MONTHLY — Foreign Trade (in millions of dollars)

	Latest Month	Exports Preceding Month	Year Ago	Imports Preceding Month	Year Ago
Chemicals, total	108.6	105.1	91.2	20.1	20.7
Coal-tar products	7.8	5.9	5.6	5.1	3.8
Industrial chemicals	19.1	15.2	11.7	6.3	7.7

New Chemicals for Industry

Here is **CHEMICAL WEEK's** New Chemicals for Industry report—a list of some 425 chemical and specialty products introduced this year.

Since manufacturers contributed the product data given in each case, further details should be requested directly from producers. See Buyers' Guide Issue (Sept. 15) for addresses.

ACETOACET-o-ANISIDIDE

$\text{CH}_3\text{COCH}_2\text{CONHC}_6\text{H}_4\text{OCH}_3$; M.W., 207.22; Sp. G., 1.1320 at 86.6/20 C; M.P., 86.6 C; flash point (open cup), 325 F; color, white; crystalline solid. Chemical properties: undergoes numerous condensation and substitution reactions that characterize compounds with reactive carbonyl and methylene groups. Suggested use: as an intermediate in the manufacture of Hansa Yellow and Benzidine pigments with improved light-fastness. Availability: commercial quantities. Carbide and Carbon Chemicals Co., a division of Union Carbide and Carbon Corp.

N-ACETYL DL-HOMOCYSTEINE THIOACTONE

$\text{C}_6\text{H}_9\text{O}_2\text{NS}$; M.W., 159.1 (anhydrous base). Suggested uses: in biochemical research, peptide synthesis. Availability: commercial quantities. Schwarz Laboratories, Inc.

ACRI-NYL DRY SIZE

A slashing compound for cotton blends with hydrophobic synthetics such as Acrilan, Dacron, nylon. Availability: commercial quantities. Morningside, Nicol, Inc.

ACRYSOL ASE-60

An acrylic emulsion copolymer containing 28% solids, developed as a thickening agent, particularly applicable for viscosity adjustments of thermoplastic resin formulations utilized for back-coating rugs and upholstery fabrics. It is also used effectively for the suspension of pigments and fillers. Its salt solutions, similar to those of natural gums or water-soluble cellulose derivatives, offer high thickening power at low solids with ease of handling and low cost. Availability: commercial quantities. Rohm & Haas Co.

ACRYSOL ASE-75

An alkali-soluble acrylic emulsion polymer, supplied at 40% solids, and designed as an efficient thickener for GRS or butadiene-styrene latices. The polymer is linear and is useful in ceramics and other applications where the choice of neutralizing cations permits a variety of combinations. Salts of ASE-75 are effectively used as dispersing and suspending agents for inert fillers, starches and other aqueous suspensions. The advantage of high solids at low viscosity in emulsion systems is combined with many of the interesting properties of acrylic water-soluble polymers. Availability: commercial quantities. Rohm & Haas Co.

ACRYSOL P-4

A warp sizing agent for Dacron which provides a tough, flexible, soft and protective film for high loom efficiency and fabric quality. It will not corrode conventional processing equipment and may be readily removed in subsequent scouring operations. Availability: commercial quantities. Rohm & Haas Co.

ADENOSINE 2'3'-CYCLIC PHOSPHATE, BARIUM

Suggested uses: in biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

"ALKANOL" CRUDE SOLUTION

An aqueous solution of an alkyl naphthalene sulfonate. This product is an effective anionic wetting and dispersing agent and is particularly suited to use where the development of foam would be undesirable. Availability: commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Chemicals Divisions.

"ALKANOL" HC SURFACE-ACTIVE AGENT

A nonionic product especially recommended for promoting the level application of disperse dyes to "Dacron" polyester fiber. Availability: commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Chemicals Division.

"ALKANOL" HCS SURFACE-ACTIVE AGENT

A nonionic surface active agent based on an ethylene oxide condensate of a high molecular weight fatty alcohol. The properties of "Alkanol" HCS suggest its uses as a retardant and leveling agent in dyeing processes, a detergent, a fulling assistant in acid media, and as an emulsifying and dispersing agent of general utility. Availability: commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Chemicals Division.

ALLYL CYANIDE

$\text{CH}_2=\text{CHCH}_2\text{CN}$; M.W., 67; Sp. G., 0.8364 at 20/20 C; B.P., 111-119 C (760 mm. Hg). Chemical properties: will add to compounds with active hydrogens, thus providing a means of introducing the cyanopropyl group which can be hydrolyzed to the carboxylic acid or hydrogenated to the amine. Suggested use: preparation of synthetic resins and pharmaceuticals. Avail-

ability: research quantities. Carbide and Carbon Chemicals Co., a division of Union Carbide and Carbon Corp.

ALUMINUM ISOPROPYLATE (Aluminum Isopropoxide)

M.W. 204.23; tetramer M.W. 816.92; Sp. G. 1.0346; melting point 118-120 C; boiling point 140 C-150 C @ 12 mm. Chemical properties: selective reducing agent for Meerwein-Ponndorf reactions; easily hydrolyzed and alcoholized. Alkoxy groups easily replaced by acyl, higher alkoxy and free hydroxyl groups. Reacts with keto-enol tautomers. Tischenko reaction catalyst. Suggested uses: In situ soap formation, Meerwein-Ponndorf reactions, ester exchange reactions, alcoholysis of esters, production of chelates and higher alcoholates, adhesion promoter, high heat finishes, production of complex aluminum soaps, and cross linking agent. Availability: commercial quantities. The Harshaw Chemical Co.

AMBERLITE ION EXCHANGE RESINS (Chromatographic Grade)

A complete series of ion exchange resins has been developed by the Rohm & Haas Co. specifically for chromatographic analyses. While chemically identical with standard and analytical-grade Amberlite ion exchange resins, the new "CG Series" offers the advantage of optimum particle size for most chromatographic requirements. The CG Series is available in four resin classifications: strongly-acidic and weakly-acidic cation exchangers; strongly-basic and weakly-basic anion exchangers. Within each classification the analyst has a choice of two particle sizes: Type I, particle size between 100 and 200 mesh (dry), and Type II, particle size passes 200 mesh (dry). Type I resin, having the large particle size that permits reasonable rapid flow rates, separates materials with appreciably different chemical properties by a combination of ion exchange and adsorption. Type II resin, because of its smaller particle size, offers the greater surface area which results in a greater rate of reaction. Flow rate over Type II resins is somewhat restricted, but materials closely related chemically may be sharply separated. Availability: commercial quantities (over 25 pounds) from Rohm & Haas Co., quantities under 25 pounds from Fisher Scientific Co.

AMINOETHYL HYDROGEN SULFATE

$\text{H}_2\text{NCH}_2\text{CH}_2\text{OSO}_3\text{H}$; crystalline, slightly hygroscopic powder; M.W., 141.15; M.P., starts to sinter at 274 C and darkens without completely melting at 280 C; soluble in water; 10-11% by wt. at 20 C; color, white. A convenient source of ethylene imine, by distillation from sodium hydroxide, or for reaction in situ. Suggested uses: intermediate for resins used in wet-strengthening treatment of paper; modification of cellulose materials to improve dyeability; manufacture of ethylene imine reaction products and polymeric materials useful as wetting or leveling agents, plastics, synthetic fibers, adhe-

*Registered trademark.

atives, rubber accelerators and antistatic agents. Availability: research quantities. Carbide and Carbon Chemicals Co., a division of Union Carbide and Carbon Corp.

ANTHRANILAMIDE (o-Amino Benzamide)

$C_7H_7ON_2$; M.W. 135.15; M.P. 108 C; white to light tan crystalline solid; soluble in hot water, alcohols; insoluble in benzene. Chemical properties: can be diazotized to form 4-keto-benzotriazine, will react with aldehydes to form Schiff's bases. Suggested uses: intermediate for insecticides and perfume materials. Availability: pilot plant quantities. Maumee Chemical Co.

ARCCO C 518

Designed for natural latex foam bonding. Users report strong bond, minimum odor, soft seam, fast drying. No heat required. May be applied by brush or spray. Availability: commercial quantities. The Borden Co., Chemical Division, Resinous-Reslac Dept.

ARCCOS C 600 AND C 601

Two solution coatings providing superior release properties for a variety of papers. Available in one- or two-part systems. Short baking required for maximum results. Availability: commercial quantities. The Borden Co., Chemical Division, Resinous-Reslac Dept.

AROGUMS

A class of derivatized potato starches, characterized by narrowly controlled viscosity ranges. Arogums form clear, colorless solutions when cooked, and deposit tough, resilient films on paper and textiles. Grades available in viscosities of from 5% to 38% of untreated potato starch. Availability: commercial quantities. Morningstar, Nicol, Inc.

"AVITEX"® ML SOFTENER

A highly effective liquid-type cationic product containing 100% active ingredient. Possesses a high substantive affinity for textile fibers and imparts a high degree of absorbency to cotton. It is suitable for use as a pure finish and in conjunction with resins on cottons and synthetic fibers. Availability: commercial quantities. E. I. du Pont de Nemours Co., Dyes and Chemicals Division.

BARIUM CITRATE CP 1202

$Ba(C_6H_5O_7)_2 \cdot 2H_2O$; M.W. (anhydrous) 790.3; white to grayish white crystalline powder; highly insoluble in water. Suggested uses: in the manufacture of barium compounds, stabilizer for latex paints. Availability: commercial quantities. The Sherwin-Williams Co., Pigment Color and Chemical Division.

BARIUM ETHYL SULFATE

$Ba(C_2H_5OSO_3)_2 \cdot 2H_2O$; M.W. 423.64; white crystals; freely soluble in water, slightly soluble in alcohol. Grade: pure. Suggested uses: soluble form of barium even in the presence of sulfates ions. Availability: laboratory scale. City Chemical Corp.

4 KETO BENZOTRIAZINE (4-Keto-3,4-dihydrobenzotriazine; 4-hydroxybenzotriazine)

$C_7H_5ON_3$; M.W. 147.13; M.P. 210 C (decomp.); yellow to tan crystalline solid; insoluble in water; very soluble in alcohol, in alkali, ether; partially soluble in ammonium hydroxide. Chemical properties: acid hydrogen group reacts with strong bases and other hydrogen acceptors, hydroxy group can be replaced by chlorine with a mixture of PCl_5 and $POCl_3$. Explodes when mixed with H_2SO_4 or PCl_5 alone. Suggested uses: intermediate for insecticides and dyestuffs. Availability: pilot plant quantities. Maumee Chemical Co.

N-BENZYL DIETHANOLAMINE

$C_{11}H_{17}ON$; M.W. 195.26; Sp. G. 1.073 at 27 C. N-benzyl diethanolamine is completely

miscible in all proportions with water and the common alcohols, ketones and aromatic hydrocarbons. Its solubility in aliphatic hydrocarbons is limited to 1% or less. Unlike other amines in this series this compound is not volatile with steam. It boils at 124 C at 2 mm. Hg. pressure and at 167 C at 30 mm. Hg. pressure. Availability: semi-commercial quantities. Sumner Chemical Co., Inc.

N-BENZYL DIMETHYLAMINE

$C_9H_{13}N$; M.W. 135.20; Sp. G. 0.894 at 27 C; colorless to light yellow liquid. An intermediate in chemical synthesis and in reactions requiring an organic base. Its water insolubility and solubility in organic fluids point to its use as an ingredient in cutting oils, hydraulic fluids and specialty lubricants where its ability to block the corrosive action of oxidation-produced acids is of value. The accepted catalyst in formulations of epoxy resins. Availability: commercial quantities. Sumner Chemical Co., Inc.

N-BENZYL ETHANOLAMINE

$C_9H_{11}ON$; M.W. 151.20; Sp. G. 1.044 at 27 C. N-benzyl ethanolamine is miscible with most alcohols, ketones and aromatic hydrocarbons; solubility in aliphatic hydrocarbons is limited, and in water only 0.4 grams of the compound will dissolve at room temperature. It will hold in solution roughly five times its weight of water. Volatile with steam, it yields a condensate containing 0.05%. At 2 mm. Hg. pressure this amine boils at 118 C and at 30 mm. Hg. pressure it boils at 159 C. Availability: semi-commercial quantities. Sumner Chemical Co., Inc.

N-BENZYL ISOPROPYLAMINE

$C_{10}H_{15}N$; M.W. 149.23; Sp. G. 0.895 at 27 C. N-benzyl isopropylamine is soluble to the extent of about 1.2% while water is soluble in this amine to the extent of about 9%. It is volatile with steam. These properties suggest its use as a rust inhibitor. This secondary amine is also useful as an intermediate in various chemical syntheses such as quaternaries. It is miscible in all proportions with most aromatic and aliphatic hydrocarbons, as well as most alcohols, ketones and esters. Availability: semi-commercial quantities. Sumner Chemical Co., Inc.

N-BENZYL-N-METHYL ETHANOLAMINE

$C_{10}H_{15}ON$; M.W. 165.23; Sp. G. 1.006 at 27 C. N-benzyl-N-methyl ethanolamine is miscible with most alcohols, ketones, aromatic and aliphatic hydrocarbons. It has a water solubility of about 4 grams per 100 ml. and dissolves one-third its weight of water. It yields a 3.3% condensate on steam distillation. At 3 mm. Hg. pressure it boils at 150 C. In addition, it has moderate surface tension depressing properties. Availability: semi-commercial quantities. Sumner Chemical Co., Inc.

N-BENZYL TRIMETHYL AMMONIUM METHOXIDE

Supplied as a 40% solution in methanol. N-benzyl trimethyl ammonium methoxide is a strong base, soluble in organic solvents and is especially useful where inorganic bases cannot be used. Experimental work suggests its use as a catalyst in organic reactions and as a basic curing agent for resins. Availability: laboratory quantities. Sumner Chemical Co., Inc.

BICYCLO (2.2.1) HEPTA 2,5-DIENE

M.W. 92.13; Sp. G. 0.912 at 20/4 C; boiling range 89.3-104.4 C at 760 mm.; M.P. -25 to -26 C; flash point -6 F. Tag Open Cup. Chemical properties: bicycloheptadiene is a dienophile and as such can be used in Diels-Alder reactions. It will undergo acid catalyzed reactions to form glycols, diethers, and diesters. It will readily undergo free radical additions and polymerization reactions. On pyrolysis, bicycloheptadiene will yield cycloheptatriene, a polyfunctional compound. Suggested uses: preparation of chemical intermediates for resins, pharmaceuticals and rubber chemicals. Availability: drum quantities. Shell Chemical Corp.; Market Development Dept.

BINDER PPI-9283

A synthetic resin binder for glitter, flock and metallics. Possesses excellent fastness to dye cleaning. Availability: commercial quantities. Morningstar, Nicol, Inc.

BINDER PPI-9326

A ready to use pigment and flock binder, fast to washing and dry cleaning. Thermoplastic, requires fusing to insolubilize. Produces a soft, colorless, clear film with excellent bonding properties. Availability: commercial quantities. Morningstar, Nicol, Inc.

BIOSTAT®-PA

A broad-spectrum antibiotic preparation containing oxytetracycline, effective against many Gram-positive and Gram-negative organisms, both aerobic and anaerobic. It is designed for specific application in commercial poultry processing to prolong the freshness time of whole ice-chilled poultry. Availability: commercial quantities to the poultry processing industry. Chas. Pfizer & Co., Inc.

BISPENOL A (2,2-Bis (4-Hydroxyphenyl) Propane)

$C_{15}H_{16}O_2$; M.P. 150-155C (solidification range); boiling point 220C at 4 mm.; insoluble in water; soluble in alcohol and acetone; refined purity; practically non-toxic. Outstanding features: high purity; high crystallizing point (154C minimum); fast reactivity; excellent color; outstanding heat stability. Suggested uses: for epoxy resins, oil-soluble modified phenolic resins, stabilizer for vinyl resins and plasticizers, and antioxidant for oils and lubricants. Availability: commercial quantities. Monsanto Chemical Co., Organic Chemicals Division.

BLANCOPHOR® DS-86

An optical whitening agent for incorporation in heavy duty laundering detergents based on nonionic and/or anionic surfactants. Stable in sodium perborate solutions and the usual soap and detergent builders such as alkali, phosphates, silicates, CMC. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

BLANCOPHOR® HS-71 SOLUTION

An optical whitening agent in liquid form which produces blue-violet brilliancy on cellulose fibers. Readily soluble in water. Can be applied on cotton and rayon fabrics either as a self-product or in combination with the usual finishing ingredients, such as resins, starch, dextrin, etc. Also used for brightening various grades of paper; effective for beater and surface coloring or for coating of paper. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

BLANCOPHOR® LS-86

An optical whitening agent for use in textile and paper trades. Soluble in water. Effective brightener for cotton and rayon which exhausts well and uniformly from a long liquor. Suggested uses: paper brightener for application in beater; brightener for bleached cotton hose, yarns, knit goods, and piece goods. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

BRILLIANT TONING RED, CP 1269

Non-resinated, bright, non-bleeding red pigment which is the strongest of its type available. Sp. G. 1.68; bulk value 0.07148 gal. per lb.; weight per solid gal. 13.99 lbs. Suggested uses: in printing inks, paints, enamels, lacquers, plastics and rubber. Availability: commercial quantities. Pigment, Color and Chemical Division, The Sherwin-Williams Co.

BUNAC KS RUBBER RECLAIMING OIL

A stabilized liquid tall oil derivative developed as a replacement for solid rosin in rubber reclaiming operations. Applicable in pan and digester processes. Acts as a non-staining reclaiming agent and yields improved tensile properties in the reclaim. Flash point above 370 F; pour point 40 F; maximum viscosity 200 CS at 130 F; acid number as abietic acid 145 (minimum). Availability: commercial quantities. Olin Mathieson Chemical Corp., Industrial Chemicals Division.

BUNAC RUBBER ACTIVATOR D-74

A secondary accelerator advantageously used in synthetic rubber tire tread compositions. Supplements primary accelerators. Increases curing range and improves resistance to cracking under repeated flexing. Also incorporated to advantage in natural rubber formulations. Flash point above 370 F; viscosity of 1100 CS (maximum) at 130 F; pour point 40 F (maximum). Availability: commercial quantities. Olin Mathieson Chemical Corp., Industrial Chemicals Division.

BUTADIENE-FURFURAL COPOLYMER (2,3,4,5-bis [Δ^2 butenylene] tetrahydro-furfural)

$C_{12}H_{16}OCHO$; Sp. G. 1.12 20/4; purity 90 mol per cent; color 6 Gardner. Uses: insect repellent, synergist for pyrethrin. Availability: research and pilot-plant quantities. Phillips Petroleum Co., Special Products Division.

*Registered trademark.

1,4-BUTANEDIOL

$C_4H_{10}O_2$; colorless liquid; M.W. 90; Sp. G. 1.015 (25/4 C); boiling point 228 C (760 mm); miscible with water, methanol, ethanol and acetone; slightly soluble in hydrocarbons. Suggested uses: preparation of simple ester and polymeric type plasticizers, polyesters, polyurethanes; solvent in inks; chemical intermediate for pharmaceuticals and textile auxiliaries. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

BUTYL ACID PHOSPHATE

A mixed mono- and dihydrogen phosphate ester containing varying amounts of polyphosphates; Sp. G. 1.13 at 20/4 C; R.I. 1.428; typical Acid No. 430 (mg KOH/g); flash point 265 F; fire point 395 F (Cleveland Open Cup); viscosity (centistokes) 77 F-101, 100 F-67, 210 F-11; pale yellow liquid; soluble in ethanol, acetone, benzene; partially soluble in water; insoluble in toluene and hexane. Chemical properties: strongly acidic and forms salts with alkalies and amines. Suggested uses: catalysts in curing of urea-formaldehyde resins; rust inhibitor; external mold lubricant for resins; amine salts as antistatic agents for non-cellulosic fibers; leather tanning; reclaiming of soldering flux; wetting agent for outback and as a flashproofing plasticizer. Availability: commercial quantities. Virginia-Carolina Chemical Corp.

t-BUTYLAMINE (1,1-DIMETHYLETHYLAMINE)

$C_4H_{11}N$; M.P. -72.6C; boiling point; 44-50C; completely miscible in water and most organic solvents; 98% minimum purity; moderately toxic (oral). Outstanding features: the most effective derivatives of t-butylamine are those wherein the efficacy of the highly-branched chain is utilized; where surface coverage is required; where mono-substitution is desired, or where hindered rotation is advantageous. Suggested use: as an intermediate for synthesis of rubber chemicals, oil and grease additives, pharmaceuticals, anti-corrosion agents, surfactants, soaps, emulsifiers, anti-static materials and agricultural chemicals. Availability: commercial quantities. Monsanto Chemical Co., Organic Chemicals Division.

TETRA-n-BUTYLAMMONIUM IODIDE

$(C_4H_9)_4NI$; M.P. 144-145 C; glistening white leaflets; slightly soluble in water; soluble in alcohol. Suggested use: supporting electrolyte for polarography and electroanalysis. Availability: pilot-plant quantities. Electro Organic Corp.

BUTYL GLUCOSIDE

$C_{10}H_{20}O_6$; M.W. 236.26; Sp. G. 1.2 @ 25/20 C; soluble in water, and in methyl, ethyl, propyl, isopropyl and n-butyl alcohols. An aqueous, non-crystallizing solution composed of mixed isomers of butyl glucoside (primarily alpha- and beta-butyl glucosides). The clear, amber sirup contains a minimum of 80% solids. Suggested use: as a softener, conditioning agent and plasticizer for adhesives and for paper and textile finishes. Availability: semi-commercial quantities. Corn Products Refining Co.

n-BUTYLISOCYANATE (Bunco)

C_4H_9NCO ; M.W. 99; Sp. G. 0.880 @ 20/4 C; boiling point 113-116 C (760 mm); soluble in anhydrous organic solvents; lacrymator; colorless. Chemical properties: isocyanate group enters into reaction with materials containing activated hydrogen atoms. Suggested uses: in the waterproofing of textiles and proteins, in the tanning of hides and skins, and in the synthesis of ureas and urethanes. Availability: commercial quantities. The Carwin Co.

BUTYNE-1,4-DIOL (2-BUTYNE-1,4-DIOL)

$C_4H_6O_2$; M.W. 86; M.P. 57.5 C; light tan crystals; soluble in water, ethanol, acetone; insoluble in benzene. Reacts as a glycol and a disubstituted acetylene. Suggested uses: corrosion inhibitor for mineral acids; stabilizer for halogenated compounds; intermediate for pharmaceuticals, solvents, plasticizers, etc. Availability: commercial quantities (solid or 35% aqueous solution). Antara Chemicals Sales Division, General Aniline & Film Corp.

DI-tert-BUTYL POLYSULFIDE

$C_8H_{18}S_2$; Sp. G. 1.0071 60/60 F; sulfur 64.0 wt. %. Suggested uses: polymerization inhibitor, flotation agent, miticide, solvent, cutting oil. Availability: research and pilot plant quantities. Phillips Petroleum Co., Special Products Division.

* Registered trademark.

BUTYROLACTONE

$C_4H_6O_2$; M.W. 86; Sp. G. 1.124 (25/4C); colorless liquid; boiling point 204 C (760 mm); miscible with water and many organic solvents; insoluble in aliphatic hydrocarbons; non-toxic; non-corrosive; stable; easy to recover; low fire hazard. Suggested uses: solvent for acetylene, polyacrylonitrile, cellulose triacetate, shellac; useful in paint removers and petroleum processing; intermediate for aliphatic and cyclic compounds including hydroxybutyric acid, 2,4-dichlorophenoxybutyric acid, methionine, thiodibutyric acid, etc. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

N-BUTYROYL-p-AMINOPHENOL

$C_{10}H_{11}NO_2$; M.W. App. 179; white to off-white powder. Suggested use: As an antioxidant in synthetic rubbers, other polymers and industrial compounds requiring stabilization against oxygen and ultraviolet. Availability: semi-commercial quantities. Sumner Chemical Co., Inc.

CATALYST H-7

A thermosetting resin catalyst developed for improving the degree of cure and better physical properties on cotton and rayon fabrics. Bath stability is excellent, and the product is compatible with cationic and non-ionic materials. Availability: commercial quantities. Rohm & Haas Co.

"CAPRACYL" Yellow GW

A neutral-dyeing metalized acid dye especially suited to the continuous dyeing of wool rawstock and for dyeing filament or spun nylon. It produces bright, greenish-yellow shades on either fiber and has very good fastness to light and wet processing. It is suitable for use on materials intended for suitings, shirtings, carpetings and automotive fabrics. Availability: commercial quantities. E. I. du Pont de Nemours Co. Inc., Dyes and Chemicals Division.

"CAPRACYL" Violet BD

A premetalized acid dye producing brownish-violet shades on nylon and wool. It is a desirable shading element in the production of tan, brown and gray shades. This product possesses very good wet and lightfastness properties, has a slow, uniform dyeing rate and good compatibility with other dyes when used in combinations. Availability: commercial quantities. E. I. du Pont de Nemours Co. Inc., Dyes and Chemicals Div.

n-CAPROLACTONE

$CH_2(CH_2)_5CO_2$; M.W. 114.07; Sp. G. 1.0776 at 20/20 C; B. P. 146 C (50 mm.) and 108 C (10 mm.); V. P. <0.1 mm. Hg at 20 C; Fr. P. -1.3 C; R. I. (nu) 1.4631 at 20 C; colorless liquid, soluble in water, complete at 20 C; sweet-smelling odor. Chemical properties: enters into condensation reactions to form polyesters. Suggested uses: synthesis of intermediates for urethane foams, elastomers and coatings; for fibers and other polyester applications; chemical intermediate. Availability: research quantities. Carbide and Carbon Chemicals Co., Division, Union Carbide and Carbon Corp.

CHEELOX® HE-24

A liquid hydroxyethyl type sequestering agent used to control calcium, magnesium, iron and other heavy metal ions. Soluble and stable in neutral, acid and alkaline solutions. Effective as an iron ion sequesterant in alkaline solutions. Suggested uses: water softener; sequesterant in liquid soaps, photographic developer baths, neutral or alkaline washing of textiles, dyeing, etc. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

CHEELOX® B-13

A liquid, all-purpose organic sequestering agent that inactivates calcium and magnesium as well as the iron often encountered with these ions. It is a balanced mixture of the soluble salts of amino carboxylic acids; soluble and stable at all temperatures in neutral, acid and alkaline solutions. Suggested uses: sequesterant in any stage of textile, paper, leather, etc., wet processing; stabilizes hydrogen peroxide bleach baths; prevents iron stains in caustic processing liquors; inactivates iron ions in alkaline solutions; water softener; clarifier for liquid soaps. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

CHEMIGUM LATEX 247

This copolymer of butadiene and acrylonitrile is a medium solids latex with improved resistance to discoloration upon exposure to heat and light. This latex is particularly suited for textile and paper impregnation and coating applications where solvent resistance is required and improved adhesion to resins is desired. Availability: commercial quantities. The Goodyear Tire & Rubber Co., Chemical Division.

2-CHLORO-4-AMINO-TOLUENE-5-SULFONIC ACID

$C_7H_5ClO_3S$; M.W. 221.6; white to buff colored powder; purity 98.5% minimum. Suggested use: in making Permanent Red 2B pigments. Availability: commercial quantities. The Sherwin-Williams Co., Pigment, Color and Chemical Division.

p-CHLOROBENZENESULFONYL CHLORIDE

$p-ClC_6H_4SO_2Cl$; M.P. 51.6 C; B.P. 141 C at 15 mm. of Hg.; purity 97%; insoluble in water. Suggested uses: as a chemical intermediate. Availability: laboratory scale. Monsanto Chemical Co., Organic Development Division.

CHLORODIMETHYL SULFIDE

CH_3-S-CH_2Cl ; M.W. 96.46; Sp. Gr. 1.16 @ 20/4 C; B. P. 105 C (760 mm.); Fr. P. <-60 C; insoluble in water; miscible in organic solvents; pungent sulfur-like odor; light yellow color. Chemical properties: Cl very reactive, replaced by strong bases such as NaOH, sodium alkoxides and amines; alkali metal thiocyanates; dithiocarbamates and xanthates. Sulfide linkage can be converted to sulfonium salts, sulfoxides or sulfones. Suggested use: chemical intermediate. Availability: research quantities. Stauffer Chemical Co., Market Development Dept.

CHLOROKOJIC ACID (2 Chloromethyl-5 Hydroxy-γ-Pyrone)

$C_6H_5O_3Cl$; M.W. 160.56; M.P. 164-166 C; soluble in pyridine (20%), acetone (3%) and ethyl acetate (1%); slightly soluble in ethanol and diethyl ether (<1%), and benzene, carbon tetrachloride, cyclohexane, iso-octane and water (<0.01%). Chemical properties: reacts with tertiary amines to form quaternary ammonium compounds; with hydrogen to form 2-methyl-5 hydroxy-γ-pyrone; with thiourea to form an isothiouonium chloride; and with sec-butyl mercaptan to form 2- (see butylmercaptomethyl)-5-hydroxy-γ-pyrone. Suggested uses: Preparation of pharmaceuticals, dyestuffs, insecticides and antifungal and antimicrobial agents. Availability: experimental quantities. Chas. Pfizer & Co., Inc.

(CHLOROMETHYL) PHOSPHONIC DICHLORIDE

$ClCH_2P(O)Cl_2$; B.P. 78-82 C at 10 mm. Hg.; purity greater than 95%; highly corrosive; soluble in most organic solvents. Outstanding features: extremely reactive chlorine atoms. Suggested use: as a chemical intermediate. Availability: laboratory scale. Monsanto Chemical Co., Organic Development Division.

BIS (CHLOROMETHYL) SULFIDE

$ClCH_2-S-CH_2Cl$; M.W. 130.9; Sp. Gr. 1.40 @ 20/4 C; B.P. 156 C (760 mm.); Fr. P. <-60 C; insoluble in water; miscible in organic solvents; pungent sulfur-like odor; light yellow color. Chemical properties: contains two reactive chlorines, replaceable by various organic bases and alkali metal salts; will alkylate malonic acid esters; chloromethylate aryl thioethers; sulfide linkage can be converted to sulfonium salts, sulfoxides or sulfones. Suggested use: intermediate for preparation of dyestuffs, lube oil additives, pharmaceuticals, etc. Availability: research quantities. Stauffer Chemical Co., Market Development Dept.

2-CHLORO-4-NITROPHENOL

$2-Cl-4-NO_2-C_6H_3OH$; M.P. 106 C minimum; soluble in acetic acid, sulfuric acid, ethyl alcohol, acetone, chlorobenzene; slightly soluble in water. Suggested use: as a chemical intermediate. Availability: laboratory scale. Monsanto Chemical Co., Organic Development Division.

3-(p-CHLOROPHENYL)-3-PHENYLPHTHALIDE

$C_{20}H_{13}O_2Cl$; M.W. 320.76; white crystalline solid; M.P. 97-98C; soluble in acetone, benzene, chlorobenzene, diethyl ether, dimethylformamide, and hot ethanol; insoluble in petroleum ether, and water; high thermal stability. Chemical properties: reacts with amines, hydrazines. Hydrolyzed by alcoholic alkali. Sodium salt liberates NaOH slowly in water. Suggested uses: intermediate for pharmaceuticals, dyes, pigments, and surface active agents; component in lubricants, dielectric media, heat exchange fluids. Availability: laboratory quantities. American Cyanamid Co.

BIS (p-CHLOROPHENYL) SULFONE

$(p-ClC_6H_4)_2SO_2$; M.W. 287.2; white crystalline solid; M.P. 147C. Chemical properties: halogens can be replaced by OH, NH₂, etc. Suggested uses: chemical intermediate; larva-

cide. Availability: research quantities. Stauffer Chemical Company, Market Development Dept.

2-CHLOROQUINOLINE

$C_{10}H_7N$; M.P. 36-37°C; white crystals; very soluble in benzene; soluble in alcohol; insoluble in water. Suggested uses: immediate. Availability: pilot-plant scale. Electro Organic Corp.

CHROMIC ACETYLACETONATE, TECHNICAL

$(CH_3CO=CH-COCH_3)_2Cr$; M.W. 349.34; M.P. 208°C; B.P. 345°C at 760 mm.; small red-violet crystals, sublime under reduced pressure; soluble in benzene; insoluble in water and hexane; stable in air to about 500°C; Chromium is completely chelated; properties of the compound are more nearly those of an organic compound than an inorganic salt. Suggested uses: to introduce chromium (III) as a homogeneous catalyst in organic systems; as a combustion control agent in rockets; as an anti-knock in internal combustion engines; as a starting chemical in the preparation of pre-metalized dyes; in making chromium complexes having surface-active properties for use in textile finishes, paper treatments, laminates and adhesives. Availability: laboratory quantities. Allied Chemical & Dye Corp., Mutual Chemical Division.

COBALT (OHS) OXIDE (COBALT MONOXIDE)

CoO; M.W. 74.94; mustard colored powder; insoluble in water; soluble in mineral acids; pure grade. Suggested uses: in glass decolorization; as a pigment; in rapid-drying paints and varnishes. Availability: laboratory scale. City Chemical Corp.

COBALT (OHS) SELENITE

$CoSeO_3 \cdot 2H_2O$; M.W. 221.9; rose-red powder; insoluble in water; soluble in selenous acid, mineral acid and ammonium hydroxide; pure grade. Availability: laboratory scale. City Chemical Corp.

COLOR CONCENTRATES FOR PLASTICS AND RUBBER

Color pigments flushed in low-molecular weight polyethylene having excellent dispersion qualities and good strength. These solids melt easily at processing temperatures, are non-dusting. Included are: FL-439, dispersed Benzidine Yellow; FL-440, dispersed Solfast Sky Blue, green shade; FL-441, dispersed Solfast Sky Blue, red shade; FL-448, dispersed Solfast Red. Suggested uses: in vinyls, polyethylene and rubber. Availability: commercial quantities. The Sherwin-Williams Co., Pigment, Color and Chemical Division.

COLORS FLUSHED IN FAST-SET OFFSET VEHICLE XLV-C92

Colors flushed in a new fast-set offset vehicle which gives better finishes than other previously employed offset vehicles. New colors include: CPX 601, Alkali Blue, red shade; CPX 602, Alkali Blue, green shade; CPX 603, Solfast Sky Blue, medium shade; CPX 604, Solfast Sky Blue, medium shade; CPX 605, Royal Victoria Blue; CPX 607, Solfast Methyl Violet; FL-453, Lake Red C; FL-455, Rubanox Red. Availability: commercial quantities. The Sherwin-Williams Co., Pigment, Color and Chemical Division.

CUNILATE #4520

An emulsion concentrate containing 10% solubilized copper-8-quinolinolate. Suggested uses: for mildewproofing textiles; as a wall wash for plant sanitation, combining fungicidal and bactericidal properties. Availability: commercial quantities. Scientific Oil Compounding Co., Inc.

CUNIMENE D-2747

A highly active fungicidal and bactericidal liquid formulation designed to stabilize materials against putrefaction. Effective in low percent-

ages. Suggested uses: in emulsion paints, adhesives and similar products. Availability: commercial quantities. Scientific Oil Compounding Co., Inc.

CRAG® MYLONE® 85W

A white crystalline powder containing 85% 3,5-dimethyltetrahydro-1,3,5, 2H-thiadiazine-2-thione. CRAG Mylone 85W is a temporary soil sterilant that will control annual and perennial weeds, nematodes, and detrimental soil fungi. This formulation can be applied dry or as a spray or drench. Almost any crop can be planted in Mylone treated soil provided a period of three weeks elapses between treating and planting. Availability: semi-commercial quantities for use with ornamental crops; research quantities for use with food or feed crops. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

CYANATEX® DYEING ASSISTANT EM

A pre-emulsified carrier for use in the dyeing of Dacron® and Dacron blend textiles in conventional equipment. The product facilitates level application and good color value within practical time periods and temperature ranges, requires no elaborate preparation or strong after-scouring, is useful with a large number of disperse dyestuffs, and is relatively non-toxic. Availability: commercial quantities. American Cyanamid Co., Specialty Products Dept.

CYANATEX® 3119 SOFTENER

A non-ionic, water-soluble ester, supplied at 35% solids, recommended for compatibility with various textile finishing chemicals. It softens and lubricates fabrics, plasticizes starches, gums and thermo-setting resins, does not interfere with the action of dye-fixing agents, tints or fluorescent brightness, does not develop odor or discolor fabric. Availability: commercial quantities. American Cyanamid Co., Specialty Products Dept.

CYANATEX® SB-100 SOFTENER

An anionic alkyl sulfosuccinate ester exhibiting unusual textile softening effects and resistance to discoloration or odor formation by heat and atmospheric gases. It is compatible with many textile finishing materials and improves the drape and handle of fabrics of all constructions. Availability: commercial quantities. American Cyanamid Co., Specialty Products Dept.

CYCLODEX

Cyclodex is a Nuodex trade name for a line of water-dispersible driers. This line includes a cobalt, manganese and lead drier. These catalysts are especially designed for use in water emulsion alkyd and latex systems to provide improved curing of film. Availability: commercial quantities. Nuodex Products Co.

CYSTEINYL GLYCINE

$C_4H_9O_3N_2S$; M.W. 223.2 (anhydrous base); important dipeptide in sulphydryl studies. Suggested uses: in biochemical research. Availability: commercial quantities. Schwartz Laboratories, Inc.

L-CYSTEINE ETHYL ESTER • HCl

$C_5H_{11}O_3NS$ • HCl; M.W. 185.7 (anhydrous base). The product is a potent and convenient biochemical antioxidant. Suggested uses: in biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

CYTIDINE 2':3'-CYCLIC PHOSPHATE, BARIUM

Standardized stable substrate for ribonuclease activity. Suggested uses: in biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

DECYLALDEHYDE

A mixture of methyl-substituted, ten-carbon aldehydes with little or no alpha substitution, the closest methyl group to the carbonyl being in the beta position. M.W. 156.26; Sp. G., 0.8290 at 20/20°C; B.P., 197.0°C (760 mm.); soluble in water, 0.01% at 20°C; odor, penetrating; color, water-white. Chemical properties: undergoes reactions typical of aldehydes. Suggested uses: chemical intermediate; preparation of high molecular weight amines for corrosion inhibitors; perfumes. Should be of interest in modifying phenolic and polyvinyl acetal resins. Availability: research quantities. Carbide and Carbon Chemicals Co., a division of Union Carbide and Carbon Corp.

DEFOAMER 2A

A non-ionic liquid surfactant, developed for the paper industry. Helps produce a finished paper, free from air voids, by preventing formation of foam and destroying existing foams in paper making machines. Especially effective in scrap

paper de-inking processes. Also used as a leveling agent on both starch and proteinaceous adhesive type coating colors. Will not become rancid in storage or impart rancidity to finished paper. Availability: commercial quantities. Witco Chemical Co.

DEFOAMER 3

A non-ionic liquid surfactant developed for the paper industry. When added to the paper formula, it will prevent the formation of foam, break up existing foam and therefore produce a paper free from air voids. Defoamer 3 is a very effective leveling agent in both starch and proteinaceous adhesive type coating colors. It has excellent storage stability. Availability: commercial quantities. Witco Chemical Co.

C14-DEOXYRIBONUCLEIC ACID

Uniformly labeled with carbon-14. Suggested uses: in biochemical and medical research. Availability: research quantities. Schwarz Laboratories, Inc.

DEOXYURIDINE, CHROMATOGRAPHICALLY HOMOGENEOUS

$C_9H_{12}O_5N_2$; M.W. 228.2; soluble in water, slightly soluble in alcohol; white crystalline powder; ultraviolet absorption: maximum at 262 mμ (pH 7.0); molar extinction coefficient: max. 10.3×10^3 (pH 7.0). For studies on growth nucleic acid biochemistry. Suggested uses: in biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

DIALLYL ADIPATE

$(C_2H_5COOCH_2CH_2)_2$; M.W. 226; boiling range, 133-140°C at 4 mm.; Saponification No. 497; Iodine No. (calculated) 224; Sp. G. 1.025 at 25°C; R.I. 1.4506 at 25°C; viscosity 3.8 cps. at 25°C. Chemical Properties: reactive, difunctional, unsaturated monomer capable of being polymerized with peroxide catalysts into hard infusible resins. Suggested uses: cross linking monomer for all types of reinforced plastics operation. Cured resin has good high degree of flexibility. Availability: plant scale. Food Machinery & Chemical Corp., Ohio-Apex Division.

DIALLYL AMINE

$(CH_2=CHCH_2)_2NH$; M.W. 97.16; Sp. G. 0.7925 at 20/20°C; B.P. 110°C (760 mm.). An unsaturated secondary amine of interest in the manufacture of resins, pharmaceuticals, fungicides, and textile chemicals. Availability: semi-commercial quantities. Carbide and Carbon Chemicals Co., division of Union Carbide and Carbon Corp.

DIALLYL CHLOROMETHYL PHOSPHONATE

$ClCH_2PO(OCH_2CH=CH_2)_2$; M.W. 210.5; water white to light yellow liquid; Sp. G. 1.1870 at 25/25°C; B.P. 87°C at 1 mm.; soluble in common organic solvents, slightly soluble in water. Polymerizes with peroxide catalyst to a hard, strong, thermosetting, self-extinguishing resin. Compatible polymerizes with vinyl acetate, methyl methacrylate, diallyl phthalate, and unsaturated polyesters. Copolymers are characterized by their excellent optical properties, solvent resistance, hardness, and flame resistance. Copolymers containing 10-30% by weight are rendered self-extinguishing. Polymers and copolymers are suitable for laminating and casting applications. Availability: research quantities. Victor Chemical Works.

DIALLYL DIGLYCOLATE

$O(CH_2COOCH_2CH=CH_2)_2$; M.W. 214; B.P. 133-138°C at 4 mm.; Saponification No. 518; Iodine No. (calculated) 237; Sp. G. 1.114 at 25°C; R.I. 1.4540 at 25°C; Viscosity 6.8 cps. at 25°C. Chemical properties: reactive, difunctional, unsaturated monomer capable of being polymerized with peroxide catalysts into hard infusible resins. Suggested uses: cross linking monomer for all types of reinforced plastics operations. Produces exceptionally clear castings with possible optical uses. Availability: plant scale. Food Machinery & Chemical Corp., Ohio-Apex Division.

DIALLYL ISOPHTHALATE (Meta)

$C_{12}H_{14}(COOCH_2CH=CH_2)_2$; M.W. 246; B.P. 158-160°C at 4 mm.; Saponification No. 447; Iodine No. (calculated) 206.5; Sp. G. 1.125 at 25°C; R.I. 1.521 at 25°C; Viscosity 13.7 cps. at 25°C. Chemical properties: reactive, difunctional, unsaturated monomer capable of being polymerized with peroxide catalysts into hard infusible resins. Suggested uses: cross-linking monomer for all types of reinforced plastic operations. Cured resin has high thermal resist-

* Registered trademark.

ance. Availability: laboratory scale. Food Machinery and Chemical Corp., Ohio, Apex Division.

DIALLYL ITACONATE

$\text{CH}_2\text{C}(\text{COOCH}_2\text{CHCH}_3)\text{CH}_2\text{COOCH}_2\text{CHCH}_3$; M.W. 210.22; Sp. G. 1.037 at 20/4 C; B.P. 130 C (9 mm. Hg.); R.I. 1.466 (20 C); water immiscible; miscible with acetone, benzene, chloroform, dioxane, ethanol,acial acetic acid and hexane. Chemical properties: may be polymerized to hard, brittle thermoset polymers. Copolymerization with other monomers induces cross-linking. Suggested uses: polymerization to give thermoplastic polymers which can be converted to thermoset resins, copolymerization with other vinyl monomers such as styrene. Can be used as a cross-linking agent for polyester resins prepared from unsaturated acids. Availability: experimental quantities. Chas. Pfizer & Co., Inc.

DIALLYL MALEATE

$(\text{CH}_2\text{COOCH}_2\text{CH}=\text{CH}_2)_2$; M.W. 196; B.P. 112-124 C at 1 mm.; Saponification No. 565; Iodine No. (calculated) 258; Sp. G. 1.076 at 25 C; R.I. 1.4682 at 25 C; Viscosity 3.8 cps. at 25 C. Chemical properties: very reactive, trifunctional, unsaturated monomer capable of being polymerized with peroxide catalysts into hard infusible resins. Suggested uses: cross-linking monomer for all types of reinforced plastics operations, particularly useful for improving cured heat distortion and ultimate heat resistance. Fastest curing of the known allyl monomers. Availability: plant scale. Food Machinery & Chemical Corp., Ohio—Apex Division.

3, 3'-DIAMINOBENZIDINE HYDROCHLORIDE

$\text{C}_{12}\text{H}_{14}\text{N}_4\cdot 4\text{HCl}$; F.W. 360.136. Offered in a crystalline form in the reagent grade and with controlled selenium sensitivity. Diaminobenzidine reacts selectively with selenium in acid medium to produce a yellow complex, which can be determined photometrically. Interfering ions can be complexed with EDTA. This new Baker reagent finds specific application in the analysis of sensitive electronic materials, copper and ferrous alloys, and high-purity copper. Availability: in commercial quantities as a laboratory reagent. J. T. Baker Chemical Co.

4,4'-DIAMINODIPHENYLSULFONE

$(\text{H}_2\text{NC}_6\text{H}_4)_2\text{SO}_2$; M.W. 248.3; M.P. approx. 160 C; purity 92 to 95%; off-white to tan; soluble in dilute acid, acetone alcohol; insoluble in benzene, water. Chemical properties: amino groups show typical but somewhat retarded activity. Suggested uses: epoxy resin curing agent, pharmaceutical intermediate, etc. Availability: pilot plant quantities. E. I. du Pont de Nemours & Co., Inc., Dyes and Chemicals Division.

N,N-DIBENZYLAMINE

$\text{C}_{14}\text{H}_{17}\text{N}$; M.W. 197.28; Sp. G. 1.017 at 27 C; colorless to pale yellow liquid. An intermediate in the synthesis of quaternary compounds and in other types of organic synthesis. Water insoluble, soluble in organic liquids. Suggested uses: as an oil-soluble rust inhibitor or as an ingredient in cutting oils, hydraulic fluids, specialty lubricants and similar products. Availability: commercial quantities. Sumner Chemical Co., Inc.

N,N-DIBENZYL ETHANOLAMINE

$\text{C}_{16}\text{H}_{19}\text{ON}$; M.W. 241.3; solid; B.P. at 0.2 mm. Hg. pressure 122 C; B.P. at 5 mm. Hg. pressure 170 C. Miscible in roughly equal proportions with alcohols, ketones and aromatic hydrocarbons. Aliphatic hydrocarbons dissolve up to one tenth of the weight of the amine; water dissolves less than 0.2 gm. per 100 ml. Availability: semi-commercial quantities. Sumner Chemical Co., Inc.

N,N-DIBENZYL METHYLAMINE

$\text{C}_{15}\text{H}_{19}\text{N}$; M.W. 211.29; colorless to light yellow liquid; intermediate in chemical synthesis; insoluble in water, soluble in organic fluids. Ability to block the corrosive action of oxidation-produced acids indicates its employment as an oil-soluble rust inhibitor, or as an ingredient in cutting oils, hydraulic fluids, specialty lubricants and related products. Availability: semi-commercial quantities. Sumner Chemical Co., Inc.

DIBS® ACCELERATOR

(N,N-Diisopropyl Benzothiazole-2-Sulfenamide) M.W. 266.42 ; Sp. G. 1.18; melting range 55-60 C; light tan flakes; characteristic odor. Gives the maximum delayed action acceleration commercially available. Suggested use: as an accelerator for SAF black tread stock compounds where the ultimate in anti-scorch protection is required. Availability: semi-commercial quantities. American Cyanamid Co., Specialty Products Dept.

*Registered trademark.

DIBUTYL CHLOROMETHYLPHOSPHONATE

$\text{CICH}_2\text{PO}(\text{OC}_4\text{H}_9)_2$; M.W. 242.5; colorless liquid; Sp. G. 1.0782; B.P. 101 C at 1.5 mm.; n_D^{20} 1.4418; F.P. (open cup) over 250 F. (closed cup) over 360 F; F.P. very viscous at -70 C; viscosity 16.0 cps at 30 C; surface tension 27.2 dynes/cm² at 30 C; soluble in most common organic solvents, insoluble in water. Suggested uses: as plasticizer for cellulose acetate, ethyl cellulose, nitrocellulose, and vinyl resins. Imparts flame-resistance to vinyl and cellulose acetate plastics. Incorporation in unsaturated polyester resins will render them flame-resistant. Availability: pilot-plant quantities. Victor Chemical Works.

DIBUTYL FUMARATE

$\text{C}_{18}\text{H}_{20}\text{O}_4$; M.P. -18 C; B.P. 285 C at 760 mm. Hg.; purity refined ester; practically non-toxic. Outstanding features: very high purity and light color. Suggested uses: as a permanent internal plasticizer for polyvinyl acetate resins; as a reactive co-monomer for other vinyl or unsaturated type resins. Availability: commercial quantities. Monsanto Chemical Co., Organic Chemicals Division.

DIBUTYL MALEATE

$\text{C}_{18}\text{H}_{20}\text{O}_4$; M.P. -85 C; B.P. 280.6 C at 760 mm. Hg.; purity refined ester; slightly toxic. Outstanding features: very high purity and light color. Suggested uses: as an internal plasticizer for polyvinyl acetate resins and as a reactive co-monomer for many other vinyl or unsaturated type resins. Availability: commercial quantities. Monsanto Chemical Co., Organic Chemicals Division.

3,4-DICHLOROANILINE

$\text{Cl}_2\text{C}_6\text{H}_3\text{NH}_2$; M.P. 70-71 C; purity 97% minimum; contains small traces of other isomers; insoluble in water; soluble in alcohol, ether. Outstanding features: high assay. Availability: commercial quantities. Monsanto Chemical Co., Organic Development Division.

N,N'-DICYCLOHEXYLCARBODIIMIDE

$\text{C}_{18}\text{H}_{26}\text{N}_2$; M.W. 266.3; M.P. 33-34 C; R.I. 1.50265 (34 C). Suggested uses: versatile reagent for synthesizing nucleotides, nucleotide combinations and peptides. Availability: commercial quantities. Schwarz Laboratories, Inc.

4-(2,4-DICHLOROPHENOXY) BUTYRIC ACID

A butoxy ethoxy propanol ester and diethanolamine salt, each containing four pounds of 2,4-dichlorophenoxy butyric acid per gallon. 2,4-DB is a selective herbicide that exhibits promise in controlling broad leaved weeds in forage legumes and certain other crops. Availability: research quantities. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

DIETHYLAMINOETHYL ACRYLATE

$\text{CH}_2=\text{CHCOOCH}_2\text{CH}_2\text{N}(\text{C}_2\text{H}_5)_2$; M.W. 171.23; Sp. G. 0.926 at 20/20 C; B.P. 116 C (50 mm.); Fr.P. acts to a glass below -100 C. Chemical properties: can be copolymerized with acrylic esters and other monomers; will add to compounds with active hydrogens, thus providing a means of introducing the diethylaminoethyl group into other molecules. Suggested uses: preparation of synthetic resins, oil soluble dispersants, and corrosion inhibitors. Availability: research quantities. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

2-DIETHYLAMINOETHYL METHACRYLATE

$\text{CH}_2=\text{C}(\text{CH}_3)\text{COOCH}_2\text{CH}_2\text{N}(\text{C}_2\text{H}_5)_2$; M.W. 185.3; Sp. G. 0.924 at 25 C; B.P. 83-92 C (10 mm.). Soluble in common organic solvents and aqueous acid. Insoluble in water. Straw-colored. Chemical properties: polymerizable monomer; will condense with active hydrogen compounds. Suggested uses: in the synthesis of plastics, fibers, adhesives, protective coatings, flocculating agents, inks, polishes, soil conditioning agents, pharmaceuticals, and various chemical specialties. Availability: semi-commercial quantities. E. I. du Pont de Nemours & Co., Inc., Dyes and Chemicals Division.

DI(2 ETHYLHEXYL)

CHLOROMETHYLPHOSPHONATE

$\text{CICH}_2\text{PO}(\text{OC}_6\text{H}_{13})_2$; M.W. 354.5. Colorless liquid. d_4^{20} 0.995, B.P. 155 C at 1 mm. n_D^{20} 1.4509. Flash point (open cup) over 250 F. (closed cup) over 360 F. Viscosity 21.0 cps at 30 C. Surface tension 28.1 dynes/cm² at 30 C. F.P. very viscous at -70 C. Soluble in most common organic solvents, insoluble in water. Compatible as plasticizer for ethyl cellulose, nitrocellulose, and vinyl resins. Imparts ex-

ceptional low-temperature flexibility to vinyl films. Has low penetration of rubber when compared with other phosphorus containing lubricants and hydraulic fluids. Availability: pilot-plant quantities. Victor Chemical Works.

DIMETHYL ACETONEDICARBOXYLATE

$\text{CH}_3(\text{COOCH}_3)_2\text{COCH}_2(\text{COOCH}_3)_2$; M.W. 174.15. Density 1.2 gm. per ml. at 25 C. B.P. 95-99 C (2 mm. Hg.). R.I. 1.4420-1.4440 (25 C.). Solubility: immiscible with water and hexane; miscible with methanol, chloroform, benzene and ethyl acetate. White to slightly yellow color. Chemical properties: will react at the carbonyl group, at the carbomethoxy groups and progressively at the active methylene groups; condenses to form oxygen- and nitrogen-containing heterocycles. Suggested uses: in the preparations of pharmaceuticals, insecticides, dyestuffs, amino acids, etc. Availability: commercial quantities. Chas. Pfizer & Co., Inc.

DIMETHYLAMINO PROPYLAMINE

$(\text{CH}_3)_2\text{NCH}_2\text{CH}_2\text{CH}_2\text{NH}_2$; M.W. 102.2 Sp. G. 0.8243 at 20/20 C. B.P. 136.5 C (760 mm.). R.I. (mp) 1.4373 at 20 C. V.P. 1.7 mm. at 20 C. Fr. P. sets to glass below -100 C. Solubility in water, complete at 20 C. Completely soluble in acetone, benzene, ethyl ether, heptane, methanol, and carbon tetrachloride at 25 C. Chemical properties: contains a primary and a tertiary amino group; reacts to form fatty acid amides, and quaternary ammonium salts. Suggested uses: intermediate for the manufacture of amides useful in the preparation of cationic surface-active agents for finishing and wetting agents; also used as a catalyst for epoxy resins. Availability: commercial quantities. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

DIPAC

Dipac is the diisopropyl sulfenamide of 2-mercaptobenzothiazole. It combines a long scorch time with a rate of cure such that the time to optimum cure of Dipac compounds is closely comparable to that of other sulfenamide accelerators. The general physical properties and aging characteristics of Dipac compounds are essentially equivalent to those obtained with other thiazoles and sulfenamides. In storage stability, Dipac ranks with the best of the sulfenamides. On the basis of laboratory tests Dipac can safely be stored under normal conditions for at least one year. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

3,3-DIPHENYLPHTHALIDE

$\text{C}_{20}\text{H}_{14}\text{O}_2$; M.W. 286.3, white crystalline solid. M.P. 115-116 C. B.P. 283-285 C at 27 mm. Soluble in acetone, benzene, chlorobenzene, diethyl ether, dimethylformamide, hot ethanol; insoluble in petroleum ether, water. High thermal stability. Chemical properties: reacts with amines, hydrazines. Hydrolyzed by alcoholic alkali. Sodium salt liberates NaOH slowly in water. Suggested uses: intermediate for pharmaceuticals, dyes, pigments, surface-active agents. Component in lubricants, dielectric media, heat-exchange fluids. Availability: laboratory quantities. American Cyanamid Co.

2,3-DIPHOSPHOGLYCERATE, BARIUM

Of interest in carbohydrate metabolism and photosynthesis. Suggested uses: in biochemical research. Availability: research quantities. Schwarz Laboratories, Inc.

DIPICOLINIC ACID

$\text{C}_8\text{H}_6\text{N}_2(\text{CO}_2\text{H})_2$; M.P. 140-142 C. White crystals. Soluble in hot water. Uses: intermediate. Availability: pilot-plant scale. Electro Organic Corp.

DISODIUM ETHYLENEDIAMINE TETRAACETATE, DIHYDRATE

$(\text{NaOOCCH}_2)_2\text{NCH}_2\text{CH}_2\text{N}(\text{CH}_2\text{COOH})_2\cdot 2\text{H}_2\text{O}$; F.W. 372.252; offered in the reagent grade as a crystalline powder and is controlled to an assay specification of 99.0% minimum. Critical impurities, heavy metals and iron are held to a low level as indicated by the specification of 0.005% and 0.010%, respectively. This reagent has the ability to form stable and soluble complexes with most polyvalent metallic ions. This chelating property permits its use in the selective precipitation and separation of some cations including those of the rare earths, and in their titrimetric determination. Availability: in commercial quantities as a laboratory reagent. J. T. Baker Chemical Co.

DI-tert-AMYL POLYSULFIDE

$\text{C}_{25}\text{H}_{54}\text{S}_2\text{C}_3\text{H}_7$; M.W. 295; Sp. Gr. 1.1383 at 60/60 F; Sulfur 54.7 wt. %, color, 11 Gardner. Uses: polymerization inhibitor, flotation agent,

miticide, solvent, cutting oil. Availability: laboratory and pilot-plant quantities. Phillips Petroleum Co., Special Products Division.

DI-tert-DODECYL POLYSULFIDE

$C_{12}H_{25}S_2C_{12}H_{25}$; M.W. 392; Sp. Gr. 1.0568 at 60/60 F; Sulfur 37.5 wt. %; color, black. Uses: polymerization inhibitor, flotation agent, miticide, solvent, cutting oil. Availability: laboratory and pilot-plant quantities. Phillips Petroleum Co., Special Products Division.

1,1-DITOLYLETHANE

$C_{16}H_{20}$; M.W. 212.32; Density 0.976 g/cc. at 25 C; B.P. 150 C (10 mm.), 300 C (760 mm.); Setting point 35-40 C; R.I. $n_D^{20} = 1.5620$. Viscosity 88 centipoises at 25 C. Flash point 180 F. Soluble in common organic solvents; insoluble in water. Chemical properties: can be nitrated, sulfonated. Treatment with potassium dichromate gives ditolyl ketone; with oxygen, Ditolylethane converts into hydroperoxide. At high temperatures, ring closure and aromatization take place, giving 2-methylantracene. Suggested uses: insecticide; solvent; plasticizer; intermediate for dispersing agents, dyes, and resins. Availability: laboratory quantities. American Cyanamid Co.

DMS and DME

Essential nonionic surfactants for use in a new class of oil well drilling fluids that will help to open up oil reservoirs too deep and too hot to be reached by conventional drilling methods. Drilling fluids containing these additives flocculate shale particles and increase solids carrying ability, are stable to high temperatures and electrolyte contamination, are nonreactive at extreme temperatures and pressures encountered in deep-bottom-hole conditions. They have a neutral pH, require no pH control and have a controllable electrical resistivity. Availability: commercial quantities. General Aniline & Film Corp.

p-DODECYLBENZYL-N,N,N-TRIMETHYL AMMONIUM CHLORIDE

Supplied as a 59.5% aqueous solution. This type of compound is an excellent bacteriostatic agent. It also shows marked lowering of surface tension in aqueous solutions. Recommended as an algicide and slimeicide in water cooling systems. Availability: semicommercial quantities. Sumner Chemical Co., Inc.

DOWFAX 2A1

New anionic surface-active agent of the sulfonate type. Soluble in H_2O , 50% at room temperature; soluble in 20% aqueous solutions of inorganic compounds, 0.1% to 20%. Light-colored, free-flowing powder containing a minimum of 85% active ingredient. Chemical properties: stable when heated for extended periods in strong basic or acid solutions. Suggested uses: for metal and hard-surface cleaning, textile processing, paper and petroleum manufacturing, etc. Performs effectively in strong aqueous solutions of electrolytes. Availability: semicommercial quantities. Dow Chemical Co.

DU PONT PAPER WHITE BP

A fluorescent whitening agent developed for use on paper by either beater or surface application. It has good solubility up to 5.0% in water, can be added dry to the pulp in the beater or pulper in quantities ranging from 2.0 to 10.0 lbs./ton of pulp can be used to brighten sized papers by adding it to the pulp slurry before the addition of size and alum. It is particularly effective when used in surface applications, and can be applied in all types of equipment currently used for applying either a water or surface sizing solution. Availability: commercial quantities. E. I. du Pont de Nemours & Chemicals Division.

DURAPLEX ND-76

A nonoxidizing phthalic alkyd resin supplied at 60% solids. It provides outstanding color and gloss retention in white industrial baking enamels, gives excellent hardness and resistance to soap and to strong detergents encountered during the service life of washing machines and

similar equipment. Availability: commercial quantities. Rohm & Haas Co.

DYSPROSIUM OXIDE

Dy_2O_3 ; M.W. 372.92. Insoluble in water. Soluble in acids. Color: off-white. It is one of the rare earth oxides. Suggested use: thermal neutron absorber. Availability: in 99% and 99.9% purities in pilot-plant quantities. Lindsay Chemical Co.

DYTOX L-68 (80% LAURYL ALCOHOL)

Approximately 80% $CH_3(CH_2)_{11}OH$ (Lauryl), 19% $CH_3(CH_2)_{13}OH$ (Myristyl) and 1.0% $CH_3(CH_2)_{19}OH$ (Decyl); M.W. approximately 191; Sp. G. 0.827-0.832 (25/15.6 C); M.P. 20-24 C. Water-white. Chemical properties: will undergo reactions typical of primary alcohols. Suggested uses: in the preparation of surface-active agents, cosmetics, lubricating oil additives, rubber chemicals and pharmaceuticals. Availability: commercial quantities. Rohm & Haas Co.

DYTOX L-79 (95% LAURYL ALCOHOL)

Approximately 95% $CH_3(CH_2)_{11}OH$ (Lauryl) and 5% $CH_3(CH_2)_{19}OH$ (Decyl); M.W. approximately 185. Water-white. Chemical properties: will undergo reactions typical of primary alcohols. Suggested uses: in the preparation of cosmetics, surface-active agents and pharmaceuticals. Availability: commercial quantities. Rohm & Haas Co.

EASTMAN POLYESTER DYES

A new series of synthetic dyes for polyester fibers, providing over-all fastness properties, includes the following colors: Yellow W, Yellow SR, Red B, Red 2G, Blue GR, Blue GLF, Blue 3RL, Navy G, Black RB. Availability: commercial quantities. Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Co.

EASTMAN POLYMERIC PLASTICIZER NP-10

A new polymeric plasticizer resulting from the esterification of neopentyl glycol with a dibasic acid, possessing unusual permanence properties at a relatively low molecular weight. NP-10, a primary plasticizer for polyvinyl chloride, is the first polymeric plasticizer to possess APHA color rating of less than 100. It produces vinyl films of excellent low-temperature flexibility. Its loss from vinyl films to hydrocarbons, soapy water and activated charcoal is extremely low, thus ensuring complete plasticization throughout the life of the plastic material. Availability: commercial quantities. Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Co.

EK-438

60-62% solids of a polyvinyl resin emulsion. Fully compatible with starches and dextrines. May be blended and cooked with starch and starch derivatives. Used in finishing and sizing of textiles to obtain body, stiffness and bond. Availability: commercial quantities. Morningstar, Nicol, Inc.

EMULPHOGENE® BC-420

An oil-soluble polyoxyalkylene ethanol-type surfactant in liquid form. Sp. G. 0.934. Used as the base material to be sulfated for incorporation in liquid detergent formulations. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

EMULSIFIER S-1537

A liquid emulsifier having excellent solubility in a wide variety of mineral oils as well as being soluble in water. This completely nonionic, 100% active emulsifier forms stable mineral oil emulsions under various end-use conditions. It is a light-yellow liquid having a titer of 10-15 C. Availability: commercial quantities. Glyco Products Co., Inc.

EMULSIFIER WHC

Designed for use in production of the so-called "waterless hand cleaners," (emulsions of water in kerosene or other petroleum solvents). Gives vibrating, jelly-type cleaner that can be wiped off or washed off. Alkylamide base. Availability: commercial quantities. Ninol Laboratories, Inc.

ERBIUM OXIDE

Er_2O_3 M.W. 382.4; Insoluble in water; soluble in strong mineral acids; Color: pink. It is one of the rare-earth oxides. Availability: in 99 or 99.9% purities in pilot-plant quantities. Lindsay Chemical Co.

ERIOCHROME BLACK T

$C_{20}H_{12}O_4NaNaS$; F.W. 461.397. Available in the reagent grade with a color sensitivity control. It finds special attention in the titrimetric determination of calcium, magnesium, zinc, lead, manganese, nickel, cobalt, copper, iron and

chromium. In the pH range 8 to 12, this indicator is blue in color; however, if the ions of magnesium, cadmium, lead, zinc, and calcium are present, a wine-red complex forms. At pH6, the free indicator changes from a wine red to blue; and above pH11 or 12, it is yellow-orange in color. This dye serves use as a chromogenic agent in the spectrophotometric determination of magnesium and calcium. It also finds use in a fluorimetric determination of gallium and in detection tests for aluminum and gallium. Availability: in commercial quantities as a laboratory reagent. J. J. Baker Chemical Co.

ESSENCE COCONUT IMITATION #25588

This imitation flavor was developed for use either as a fortifier or as complete replacement for natural coconut. Imparts very close simulation of coconut's natural flavor in desserts, puddings, pie fillings, baked goods and confections. Availability: commercial quantities. Fritzsche Brothers Inc.

ETHYL ACID PHOSPHATE

A mixed mono- and dihydrogen phosphate ester containing varying amounts of polyphosphates; Sp. G. 1.27 at 20/4 C; mp 1,420; Typical Acid. No. 585 (mg KOH/g); Flash point 245 F and fire point 410 F (Cleveland Open Cup); viscosity (centistokes) 77 F-98, 100 F-64, 210 F-11. Pale yellow liquid. Soluble in water, ethanol, and acetone; insoluble in benzene, toluene and hexane. Chemical properties: strongly acidic and forms salts with alkalies and amines. Suggested uses: catalysts in curing of urea-formaldehyde resins; rust inhibitor; external mold lubricant for resins; amine salts as anti-static agents for noncellulosic fibers; leather tanning; reclaiming of rubber; soldering flux; wetting agent for cutback asphalt; and as flameproofing plasticizers. Availability: commercial quantities. Virginia-Carolina Chemical Corp.

ETHYL AMYL CARBINOL (5-METHYL-3-HEPTANOL)

$C_{12}H_{26}O$; M.W. 186.25; Sp. G. 0.826 at 20/4 C; boiling range 166-172 C at 760 mm. Suggested uses: in plasticizers, oil additives, and as a chemical intermediate or solvent. Availability: commercial quantities. Shell Chemical Corp., Market Development Dept.

ETHYLENE CARBONATE

$C_2H_4CO_3$; M.W. 88.1; Sp. Gr. at 60/4 C, 1.300; F.P. 36 C. Solubility in water > 100% at 25 C. Solubility in methanol and ether > 100% and 10% respectively at the same temperature. White solid. Chemical properties: reacts with phenols, thiophenols, mercaptans, carboxylic acids and amines with active hydrogens, etc. Suggested uses: as a solvent and spinning solution for certain synthetic fibers. Availability: semicommercial quantities. Dow Chemical Co.

ETHYLENEDIAMINE TETRAACETIC ACID

$(HOOCCH_2)_2NCH_2CH_2N(CH_2COOH)_2$; F.W. 292.253; Ethylenediamine tetraacetic acid is offered in the reagent grade as a crystalline powder controlled to an assay specification of minimum 99.0%. Critical impurities such as heavy metals and iron are held to limits of 0.001 and 0.005%, respectively. This acid has a diversity of uses in the chelation of ions, and as a "masking" agent in analytical and general chemistry. Availability: in commercial quantities as a laboratory reagent. J. T. Baker Chemical Co.

ETHYL GLUCOSIDE

$C_{12}H_{24}O_6$; M.W. 208.18; Sp. G. 1.272 at 25/20 C; soluble in water, and in methyl, ethyl, propyl and isopropyl alcohols. An aqueous, noncrystallizing solution composed of mixed isomers of ethyl glucoside (primarily alpha- and beta-ethyl glucosides). The clear, essentially colorless sirup contains a minimum of 80% solids. Suggested uses: in the manufacture of diesters having application as surface active agents, as a conditioning agent, humectant and plasticizer for use with glue and adhesives, sizes, glassine papers, leather products and tobacco. Availability: semicommercial quantities. Corn Products Refining Co.

C¹⁴-EUGLENA EXTRACT

An acetone solution of C¹⁴-randomly labeled chlorophylls and lipids. Suggested uses: in biochemical and medical research. Availability: research quantities. Schwarz Laboratories, Inc.

EUROPIUM OXIDE

Eu_2O_3 ; M.W. 352.0; insoluble in water; soluble in acids. Color white. Suggested uses: thermal

*Registered trademark.

neutron absorber, activator in phosphors. Availability: 95% to 99.9% purities, pilot-plant scale. Lindsay Chemical Co.

FERRO NONTOTOXIC STABILIZER 707X

A heat and light stabilizer for plasticized polyvinylchloride calendaring and plastisol resins, designed for use where freedom from toxic or doubtful ingredients is needed. Ferro Stabilizer 707X gives a somewhat better color in the initial heating or curing stages of the plastic. It is considered acceptable for use in films for contact with water- or oil-based foods by both USFDA and by the Canadian Dept. of National Health and Welfare. Availability: commercial quantities. Ferro Chemical Corp.

FERRO NONTOTOXIC STABILIZER 760X

A heat and light stabilizer for plasticized polyvinylchloride calendaring resins, designed for use where freedom from toxic or doubtful ingredients is needed. Ferro Stabilizer 760X yields vinyl plastics with longer term heat stability. It is considered acceptable for use in films for contact with water- or oil-based foods by both the USFDA and by the Canadian Dept. of National Health and Welfare. Availability: commercial quantities. Ferro Chemical Corp.

FERRO STABILIZER 768

A heat and light stabilizer for polyvinylchloride calendaring and plastisol resins, composed of ingredients considered nontoxic. Ferro 768 gives exceptional heat stability from beginning to end of the normal P.V.C. curing cycle. Recommended for use in nontoxic applications where USFDA approval is not needed or where the plastics manufacturer wishes to submit likely candidates for such approval. Availability: commercial quantities. Ferro Chemical Corp.

FERRO STABILIZER 1212

A new type of cadmium- and barium-containing liquid stabilizer for polyvinylchloride calendaring and plastisol resins, designed to overcome the difficulties associated with the cadmium and barium laurate soaps such as over-lubricity, haze and poor printability or heat sealability. Ferro 1212, in addition, gives exceptional water white vinyls during normal heat curing cycles. Availability: commercial quantities. Ferro Chemical Corp.

FINISH NT

Textile finishing compound for synthetic fibers. Produces full firm handle with good adhesion to hydrophobic fibers. Availability: commercial quantities. Morningstar, Nicol, Inc.

"FLEXOL" PLASTICIZER 380

A monomeric phthalate; Sp.G. 0.9840 at 20/20 C; B.P. 241 C (5 mm); V.P. 0.69 mm; Hg at 200 C; viscosity 86.5 cps. at 20 C; R.I. (n/D) 1.4875 at 20 C; flash point (open cup) 450 F; insoluble in water; light colored liquid; little or no odor. A monomeric primary plasticizer for vinyl chloride resins. Excellent heat and light stability and electrical properties. It has remarkable resistance to nitrocellulose lacquer marring and is superior to many polymeric plasticizers in this respect. Suitable for use in all segments of the vinyl plastics industry, calendared film and sheeting, electrical insulations, profile extrusions, cloth coatings and in dispersions, including slush molding, dip molding and vinyl foam, particularly where resistance to nitrocellulose marring is required. Availability: commercial quantities. Carbide and Carbon Chemicals Corp., division, Union Carbide and Carbon Corp.

FOSBOND 24

One of the newest products in the Fosbond line of phosphating chemicals for the metal finishing trade. For use in a five-stage phosphating line. It deposits a high quality iron phosphate-type coating. The coatings produced are exceptionally consistent on a wide variety of steels. After painting, the finish system incorporating Fosbond 24 is characterized by very high humidity and water resistance. Availability: commercial quantities. Pennsylvania Salt Manufacturing Co.

FOSBOND 25

One of the newest products in the Fosbond line

*Registered trademark.

of phosphating chemicals for the metal finishing trade. It is designed to clean metal and deposit a phosphate coating in one operation. The coating developed is an iron phosphate type. Outstanding features are consistency of the coating and exceptionally high humidity and water resistance of the film under paint. Availability: commercial quantities. Pennsylvania Salt Manufacturing Co.

FOUNDREZ 7555 AND 7150

A powdered phenolic and an alcohol solution of a phenolic resin designed to be used together in the production of shell cores and molds by either dumpbox or blowing methods. The new system provides faster baking cycles, improved bonding strength, unusual release properties and a higher rate of core and shell mold production. The need for catalysts, lubricants, alcohol, etc., is eliminated. Availability: commercial quantities. Reichhold Chemicals, Inc.

FOUNDREZ 7200 (COROVIT)

A cold setting organic core binder with a controllable accelerator, developed for the expeditious production of large and complicated cores. Solidifying at room temperature in the core box, the binder provides its own green strength and prevents distortion of cores on baking. Use of this material enables the foundry man to reduce core supports, ram cores more densely and easily, and decrease labor and baking time. Cores have excellent collapsibility and castings produced are smooth. Availability: commercial quantities. Reichhold Chemicals, Inc.

FOUNDREZ 7605

A completely water-soluble aminoaldehyde thermosetting resin core binder with excellent collapsibility and rapid baking characteristics, developed for the production of castings with a wide range of pouring temperatures (aluminum to gray iron). It has the added advantage of emitting much less odor than the normal urea-formaldehyde type binders. Availability: commercial quantities. Reichhold Chemicals, Inc.

FREEZIST STARCH

A new freeze-thaw stable food starch. A starch specifically made for the frozen foods industry. Will not retrograde, weep or cloud on freezing or subsequent thawing. Higher clarity and better cold resistance than any other starch. Precooked, it disperses easily, and reduces the normal cooking requirements. Availability: commercial quantities. Morningstar, Nicol, Inc.

FUNGITROL-ALPHA

An organic, non-toxic fungicide for use in oleoresinous paint. It also offers distinct advantages as a fungicide for vinyl film, supported and unsupported. Its use is suggested in blister-resistant paints, greenhouse paints and maintenance paints not containing reactive pigments such as lead and zinc. Availability: commercial quantities. Nuodex Products Co.

GADOLINIUM OXIDE

Gd₂O₃; M.W. 361.8; insoluble in water; soluble in acids; color white; one of the rare earth oxides. Suggested use: as a thermal neutron absorber. Availability: 99% and 99.9% purities, pilot plant scale. Lindsay Chemical Co.

GLYCINE (AMINOACETIC ACID), FEED GRADE

NH₂-CH₂-COOH; M.W. 75.07; decomposes at 236C; purity 98%; solubility 250 grams/liter in water at 25 C. Suggested use: as an essential amino acid for poultry feeds. Availability: commercial quantities. Monsanto Chemical Co., Organic Chemicals Division.

GRAN-FORM

Complete granular fertilizers. Stocks of 14-14-14, 10-20-20, 10-20-10, 10-10-10 and 6-24-24 are immediately available. Other analyses and special formulations can be manufactured on request. These fertilizers are free-flowing, relatively dust-free and much more highly concentrated than the usual formulations used in agriculture. Shipments can be made bagged or bulk, domestic and export. Availability: commercial quantities. Pennsylvania Salt Manufacturing Co.

GUANOSINE, CHROMATOGRAPHICALLY HOMOGENEOUS

C₁₀H₁₃O₅N₅; M.W. 283.2; insoluble in cold water; slightly soluble in hot water; soluble in alkali; white, somewhat iridescent crystalline powder; hydrolyzes in acid; ultraviolet absorption maximum at 252.5 mμ (pH 6.0); molar extinction coefficient ε max. 13.65 x 10³ (pH 6.0). For precise research and microbiological assay. Suggested uses: in biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

DI-tert-HEPTYL DISULFIDE

C₇H₁₅SSC₇H₁₅. Suggested uses: as a chemical intermediate, solvent. Availability: experimental quantities. Phillips Petroleum Co., Special Products Division.

HEXACHLOROBENZENE

C₆Cl₆; M.W. 284.8; Sp.G. 1.105 at 25/25 C; B.P. 131 C (760 mm Hg); solubility in water <0.1% at 25 C; completely soluble in methanol and ether at the same temperature; white crystalline solid; reacts readily with nucleophilic compounds. Suggested uses: in control of "stinking smut" and "dwarf hant." Availability: commercial quantities. Dow Chemical Co.

HEXACHLORODISILOXANE (TECHNICAL)

Cl₂Si-O-SiCl₂; M.W. 284.9; clear, colorless fuming liquid; purity 95%; B.P. 133-134 C; F.P. approximately -35 C. Hydrolyzes in water; soluble in hydrocarbons, ethyl ether, CCl₄, SiCl₄, CS₂, etc. Undergoes usual reactions of Si-Cl bond, i.e., replaceable by alcohols, thiols, acids, Grignard reagents, alkyl-lithium compounds. Suggested uses: chemical intermediate for the preparation of hydraulic and lubricating fluids, silicon resins, anti-foam agents, etc. Availability: research quantities. Stauffer Chemical Co., Market Development Dept.

2,4-HEXADIENAL

CH₃CH=CHCH=CHCHO; M.W. 96.12; Sp.G. 0.894 at 20/20 C; B.P. 170.9 C (760 mm); V.P. 1.2 mm Hg at 20 C; F.P. -27.9 C; solubility in water 0.73% by wt. at 20 C. Suggested use: as a chemical intermediate. Availability: research quantities. Carbide and Carbon Chemicals Co., division, Union Carbide and Carbon Corp.

HOLMIUM OXIDE

Ho₂O₃; M.W. 377.88; insoluble in water; soluble in strong mineral acids; color light buff; one of the rare earth oxides. Availability: in 99% purity in pilot plant quantities. Lindsay Chemical Co.

DL-HOMOCYSTINE

C₆H₁₂O₄N₂S₂; M.W. 268.3 (anhydrous base). Suggested uses: in biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

DL-HOMOCYSTEINE THIOLACTONE • HCl

C₄H₇•HCl; M.W. 153.6 (anhydrous base). Suggested uses: in biochemical research, peptide synthesis. Availability: commercial quantities. Schwarz Laboratories, Inc.

HYCAR 1072

A medium high acrylonitrile dry rubber modified to contain carboxyl groups in the polymer chain. Can be cured to optimum properties with zinc oxide alone, or in combination with conventional curatives. The product has hardness, improved low temperature resistance to brittleness, good hot tear and abrasion resistance. Availability: commercial quantities. B. F. Goodrich Chemical Co.

HYCAR 1852

A medium high acrylonitrile latex supplied at approximately 40% total solids. An excellent clay binder for high total solids paper coating. Also used in adhesives and in applications requiring stability in presence of polyvalent metallic ions or alcohol. Availability: commercial quantities. B. F. Goodrich Chemical Co.

HYDROGENATED BISPHENOL A (TECHNICAL); 2.2 BIS

$C_{15}H_{22}O_2$; purity 85-89%; relatively harmless; soluble 19% in ethanol; 100% in benzene, toluene, xylene and acetone. Outstanding features: high molecular weight diol which should offer unusual stability to heat and light in condensation resins. Suggested uses: for new unsaturated and saturated polyesters and experimentally for plasticizers, adhesives, surface active agents, pharmaceuticals, and agricultural chemicals. Availability: experimental quantities. Monsanto Chemical Co., Organic Chemicals Division.

2-HYDROXYQUINOLINE (CARBOSTYRIL)

$HO-C_6H_4-N$; M.P. 198-199 C; white needle-like crystals. Soluble in hot water; very soluble in alcohol. Suggested uses: as an intermediate. Availability: pilot plant quantities. Electro Organic Corp.

HY-PHOS

Sodium glassy phosphate. Manufactured under patent. Exhibits the highest sequestering action of any of the polyphosphates. Used in water-treatment, dispersing clays for paper coating, oil-well drilling muds, soap and detergent formulations. Contains 65 to 67% P_2O_5 , 33 to 35% Na_2O as an amorphous glass. In plates or fine grind. Shipped in 100-lb. bags. Availability: commercial quantities. Pennsylvania Salt Manufacturing Co.

IGEPAL® CF-510

A 100% active alkyl phenoxy polyoxyethylene ethanol in liquid form. The principal use of this nonionic surfactant is as an emulsifying agent for mineral oil. Dispersible in water; soluble in xylene, ethanol, carbon tetrachloride. Availability: commercial quantities. Antara Chemicals, Sales Division, General Aniline & Film Corp.

IGEPAL® CO-210

A 100% active nonionic surfactant in liquid form; a nonylphenoxy polyoxyethylene ethanol. Used as an emulsion stabilizer and defoaming agent in certain surfactant systems. Also of interest as a chemical intermediate in the synthesis of plasticizers, oil additives, stabilizers, detergents, etc. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

INDUSTRIAL ODORANT #24378 FOR DETERGENTS

A blend of lemon and lily notes providing excellent coverage of basic or fatty odors of detergents. Effective at 0.1% in liquid detergent and 0.13% in powdered product. Availability: commercial quantities. Fritzsche Brothers, Inc.

INDUSTRIAL ODORANT #24939 FOR FUEL OIL

A powerful odorant intended to modify mercaptan and sulphurous odors in fuel oil. Used at the rate of 0.01% to 0.02%. Availability: commercial quantities. Fritzsche Brothers Inc.

INDUSTRIAL ODORANT #25286 FOR WAXES AND POLISHES

Characterized by a refreshing pine-mint odor which yields a high coverage when used at the rate of 0.05% to 0.1% in waxes or in liquid polishes. Availability: commercial quantities. Fritzsche Brothers, Inc.

INOSINE-8-C¹⁴

Specifically labeled in the carbon-8 position. Suggested uses: in biochemical and medical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

INOSINE. CHROMATOGRAPHICALLY MOMOGENEOUS

$C_{10}H_{12}O_2N_4$; M.W. 268.2; slightly soluble in cold water (2% at 25 C); moderately soluble in hot water; soluble in alkali; insoluble in alcohol; hydrolyzes in acid; white crystalline needles; ultraviolet absorption maximum at 250 mμ (pH 7.0); molar extinction coefficient ε max. 12.2×10^4 (pH 7.0). An important cellular metabolite, particularly in erythrocytes. Suggested uses: biochemical and medical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

INOSINIC ACID-8-C¹⁴

Inosine 5'-phosphate specifically labeled in the carbon-8 position. Suggested uses: in biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

IODINE MONOCHLORIDE

ICI; M.W. 162.4; reddish-brown liquid or crystals; irritating odor; M.P. 27 C; B.P. 97 C; pure grade; soluble in water, alcohol, ether, carbon disulfide. Availability: laboratory scale quantities. Suggested uses: chemical syntheses and analyses. City Chemical Corp.

IRRADIATED POLYETHYLENE EXTRUSION COMPOUND

Special processing results in an irradiated polyethylene compound that is extrudable and has the improved properties of freedom stress cracking and high temperature (to 200 C) form stability. More void-free extrusions are obtainable from Irrathene® extrusion compound than from conventional polyethylene. A stabilizer added to the material inhibits oxidation at high temperature. Availability: semi-commercial quantities. General Electric Co., Chemical Development Dept.

ISATOIC ANHYDRIDE

$C_8H_5O_3N$; M.W. 163; M.P. 240 C (decomposition); white crystalline solid; insoluble in water; soluble in acetone; slightly soluble in alcohols. Reacts readily with aliphatic and aromatic alcohols to form anthranilate esters; with mercaptans to form esters of thioanthranilic acid; with ammonia to form anthranilamide; with amines to form substituted anthranilamides. Can be ring substituted, e.g., with halogen, nitro and sulfo groups. Suggested uses: preparation of anthranilate esters, chemical intermediate. Availability: pilot-plant quantities. Maumee Chemical Co.

ISOASCORBIC ACID

$C_6H_8O_6$; M.W. 176.12; solubility in water about 40% at 25 C; white crystalline powder; acid taste. Serves as antioxidant primarily for food products. It is used in the meat industry to provide greater color retention in processed meat products. Used in carbonated and still beverages to protect color and flavor. May be used for protecting color and flavor in frozen fruits. Recommended for use in beer to inhibit oxidative flavor changes. Has little or no vitamin C activity. Availability: commercial quantities. Chas. Pfizer Co., Inc.; Sumner Chemical Co., Inc.

ISOBUTYRONITRILE

$(CH_3)_2CH-C \equiv N$; boiling range 100-105 C; Sp. G. 0.7690-0.7720 at 20/20 C; APHA color 20 maximum; water 0.8% maximum; aldehydes (as carbonyl) 1.0% maximum. The molecule is short and compact, with the reactive nitrile group available for various additions. Thermal cracking, dehydrogenation or selective oxidation result in the formation of methacrylonitrile. Availability: commercial quantities. Chemical Products, Inc., subsidiary of Eastman Kodak Co.

ISO-OCTANOIC ACID

$C_7H_{15}COOH$; a mixture of dimethyl hexanoic acids and methyl heptanoic acids with the closest methyl substitutions occurring in the beta position; M.W. 144.21; Sp. G. 0.8189 at 20/26 C; distillation range 226.5-242 C (760 mm); solubility in water 0.15% by weight at 20 C; color water-white. Undergoes reactions typical of organic acids. Suggested uses: intermediate for metallic paint driers, non-yellowing alkyl resins, vinyl stabilizers, plasticizers, fungicides, synthetic lubricants, water-treating amides. Availability: research quantities. Carbide and Carbon Chemicals Co., division, Union Carbide and Carbon Corp.

ISOCTYL ACID PHOSPHATE

A mixed mono- and dihydrogen phosphate ester containing varying amounts of polyphosphates. Sp.G. 1.02 at 20/4 C n_D²⁰ 1.446; typical acid number 305 (mg KOH/g); flash point 335 F; fire point 405 F (Cleveland Open Cup); viscosity (centistokes) 77 F-230, 100 F-128, 210 F-15; pale yellow liquid; soluble in ethanol, acetone, benzene, toluene, and hexane; insoluble in water. Strongly acidic and forms salts with alkalis and amines. Suggested uses: catalysts in curing of urea-formaldehyde resins; rust inhibitor; external mold lubricant for resins; amine salts as anti-static agents for non-cellulosic fibers; leather tanning; reclaiming of rubber; soldering flux; wetting agent for cutback asphalt; and as a flameproofing plasticizer. Availability: commercial quantities. Virginia-Carolina Chemical Corp.

ISOPRENE (2-METHYL BUTADIENE-1, 3)

C_5H_8 ; M.W. 68.114; B.P. 34.08 C; M.P. -146 C; R.I. 1.4216 at 20/D; Sp. G. 0.6808 at 20/4 C; insoluble in water; soluble in alcohol, ether. Readily oxidizable and polymerizable. Suggested uses: for the manufacture of butyl rubber, resins, chemical intermediates. Grade: polymerization (99+ suitable for catalytic polymerization to synthetic rubber). Availability: laboratory and pilot plant quantities. Phillips Petroleum Co.

4-ISOPROPYL-m-PHENYLENEDIAMINE

$(CH_3)_2CHC_6H_3(NH_2)_2$; M.W. 150.2; M.P. approx. 31 C; purity, approx. 99%; color clear with darkening on storage; soluble in organic solvent and dilute aqueous acid; insoluble in water but forms hemi-hydrate. Suggested uses: epoxy resin curing agent, intermediate for isocyanates, dyes, etc. Availability: pilot-plant quantities. E. I. du Pont de Nemours & Co., Inc., Dyes and Chemicals Division.

JASMA

This specialty may be used wholly or partially as a replacement for absolute jasmine. The odor effect is remarkably similar to the natural product. It may be used to give a mediocre composition high quality backing which the floral absolute contributes, without the usual prohibitive cost. Availability: commercial quantities. Fritzsche Brothers, Inc.

JEF GUM HV

A prepared high viscosity printing gum for all types of dyestuffs. Availability: commercial quantities. Morningstar, Nicol, Inc.

KOYL PALMITATE

$C_{22}H_{44}O_2$; M.W. 380; M.P. 98-99 C; solubility < 1% in acetone, benzene, carbon tetrachloride, ethyl acetate, ether, toluene, xylene; < 0.01% in cyclohexane, ethanol, methanol, iso-octane; insoluble in water; solubility in cottonseed, peanut and sesame oil 0.02% at 25 C; 2.1% at 50 C; 2.6% at 65 C; less soluble in heavy mineral oil. Forms chelates with various metallic ions which do not precipitate from certain nonaqueous media, such as hydrocarbons. Tends toward instability when exposed to light and heat. Suggested uses: chelating agent in nonaqueous systems, such as paints and oil. Availability: experimental quantities. Chas. Pfizer & Co., Inc.

KELTHANE (1,1-BIS (CHLOROPHENYL) 2,2,2-TRICHLOROETHANOL)

An agricultural insecticide for the control of mites attacking fruits, vegetables and ornamental plants. Effective against most important mite species, low in mammalian toxicity, long residual activity. Availability: commercial quantities as technical material and wettable powder or emulsifiable formulations. Rohm & Haas Co.

*Registered trademark.

"LATYL" BLUE RB

A dispersed dye suitable for producing deep shades on "Dacron" Dyes levelly, does not tar, and, when used in browns, navies and blacks, produces shades with good fastness to light and wet processing. Availability: commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Pigments Division.

"LATYL" DEVELOPER B SOLUTION

Specialty prepared for use in the application of "Latyl" Diazo Black B to "Dacron" polyester fiber. When the product is subsequently acidified during dyeing to form the free naphthol, a finely divided colloidal dispersion is obtained. Has proved successful in both laboratory and mill evaluations in producing desired shades at high temperatures on both spun and filament "Dacron" and on blends of "Dacron" with cotton or nylon. It considerably reduces the make-ready time and assures the dyer of more satisfactory shades and greater dependence in reproducing such shades. Availability: commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Chemicals Division.

"LATYL" ORANGE 3R

A dispersed dye which yields brownish-orange shades and is recommended as a component for tans, browns and grays. It exhibits good fastness to light and wet processing. Can be used on "Arnel" and has fair affinity for "Acrilan." Availability: commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Chemicals Division.

"LATYL" SCARLET FS

A dispersed dye which builds up well, does not tar in the dyebath, is essentially non-subliming and possesses good dyebath stability. Can be used alone for heavy scarlets or as the red component in maroon and deep brown shades. Shows good wetfastness and has adequate lightfastness for many end uses. Availability: commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Pigment Division.

LAVEPON WS-2

A non-ionic surfactant, outstanding for raw wool scouring in neutral or alkaline systems; also for wool piece goods, top and skeins. It produces fiber with superior color and physical properties. Availability: commercial quantities. Rohm & Haas Co.

LEAD TETRAPHOSPHATE

$Pb_3P_4O_{13}$; M.W. 953.6; white powder; insoluble in water; soluble in phosphorous acid and nitric acid. Availability: Pilot-plant quantities. City Chemical Corp.

"LEUCOSOL" BLACK G DOUBLE PASTE

An anthraquinone vat dye for printing cotton and rayon, of particular interest for its outstanding lightfastness. Applied in full shades it approaches 320 hours Fadeometer exposure with the additional advantages of showing a monotone fade at all concentrations. Recommended for printing drapery, upholstery, dress goods and similar materials. The product retains its outstanding lightfastness when fabrics to which it is applied are subjected to resin treatments. Availability: commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Chemicals Division.

"LEUCOSOL" GRAY FL PASTE

An anthraquinone vat dye for printing cotton or rayon. When printed on these fibers it shows good resistance to water spotting, good fastness to crocking, light and other color-destroying influences. Availability: commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Chemicals Division.

LEUKANOL C

Synthetic tannin agent based on formaldehyde condensed phenolsulfonic acid. This material is

*Registered trademark.

used in the production of white and pastel leathers having excellent resistance to color change on exposure to light. Availability: commercial quantities. Rohm & Haas Co.

C¹⁴-LIPID FRACTION

Crude, undifferentiated solution; small amounts of chlorophylls present. Suggested uses: in biochemical research. Availability: research quantities. Schwarz Laboratories, Inc.

MANGANESE CHROMATE, TECHNICAL

$Mn_2CrO_5 \cdot 2H_2O$; M.W. 277.90; brown powder; true valency of chromium and manganese undetermined, stable at 100°C; loses all water at 300°C. Suggested uses: as an additive to paints, varnishes and drying oils; in ceramic colors. Availability: pilot-plant quantities. Allied Chemical & Dye Corp., Mutual Chemical Division.

MARACON A

A water-reducing admixture based on a purified lignosulfonate for use in concrete products. It is supplied as non-hygroscopic powder. When added to concrete mixes, it permits a reduction in unit water content without impairing workability of the mixes. Higher ultimate strengths are also obtained with no increase in cement content. Availability: commercial quantities. Marathon Corp.

MARLEX 50 POLYETHYLENE

Melt index 0.6-0.8, softening temperature 260°F, impact strength 3.0 ft.-lb/in. indicate the desirable balance of properties of this thermoplastic. Its general toughness, chemical resistance, impermeability and temperature resistance suggest wide fields of application, both old and new. Ready fabrication by conventional plastics processing equipment simplifies its use in the fields of injection molding, extrusion and blow molding. Availability: semi-commercial quantities. Phillips Chemical Co.

METHIONINE HYDROXY ANALOG CALCIUM

M.W. 169; minimum purity 95%; solubility 7.2% in water at 25°C; greater biological activity and water solubility than dl-methionine. Suggested uses: in poultry, swine and dog feeds or wherever methionine simplicity is needed. Availability: commercial quantities. Monsanto Chemical Co., Organic Chemicals Division.

1-METHOXY-1,3-BUTADIENE

$CH_3OCH=CHCH=CH_2$; M.W. 84.11; Sp.G. 0.8318 at 20/20°C; B.P. 90.9°C (760 mm); Fr.P., -62.6°C. Can be polymerized alone or with other vinyl ethers in the presence of acid catalysts; can be copolymerized with vinyl acetate and other monomers by emulsion techniques; undergoes Diels-Alder reactions. Suggested uses: preparation of synthetic resins and pharmaceuticals. Availability: research quantities. Carbide and Carbon Chemicals Co., division, Union Carbide and Carbon Corp.

METHOXY POLYGLYCOL 550 MONO LAURATE S-1542

A liquid 100% active non-ionic ester. Shows interesting solubility and emulsification properties. Supplied in the form of a light yellow liquid having a titer of 19°C. Suggested uses: for pharmaceutical and cosmetic applications. Availability: commercial quantities. Glyco Products Co., Inc.

N-METHYL-BIS(AMINOPROPYL) AMINE

$CH_3N(NH_2CH_2CH_2CH_2)_2$; crystalline solid; M.W. 145.25; Sp.G. 0.9014 at 20/20°C; B.P. 98°C (6 mm) and 55°C (1 mm); R.I. (nd) 1.4690 at 30°C; white color. Undergoes reactions typical of primary and tertiary amines. Suggested uses: chemical intermediate. Availability: semi-commercial quantities. Carbide and Carbon Chemicals Co., division, Union Carbide and Carbon Corp.

4,4'-METHYLENEBIS (α-CHLOROANILINE)

$(H_2NCAH_3CL)_2CH_2$; M.W. 267.2; M.P. 100 to 105°C; purity in excess of 98%; soluble in alcohol and concentrated acids; insoluble in

water and dilute acids. Suggested uses: epoxy resin curing agent, synthetic intermediate. Availability: pilot plant quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Chemicals Division.

N-METHYL FORMANILIDE

C_8H_9ON ; colorless to light yellow; 95% will distill in the range 115°C to 118°C at 75 mm. Suggested use: in the formylation of aromatic compounds using phosphorous oxychloride as a condensing agent. Availability: commercial quantities. Sumner Chemical Co., Inc.

METHYL GLUCOSIDE

$C_7H_{14}O_4$; M.W. 194.18; Sp.G. 1.45 at 30/4°C; M.P. 168°C; solubility in water (108 g/100 g at 20°C); white crystalline powder. A cyclic polyol. Can be esterified with fatty acids to give partial esters having excellent surface-active properties. Enters into alcoholysis reactions with linseed, dehydrated castor and soybean oils giving products with improved bodying rate and drying characteristics. Suggested uses: in the manufacture of surface-active agents, the preparation of oil-modified resins, the alcoholysis of triglycerides, and the production of varnishes, resins and plasticizers. Availability: semi-commercial quantities. Corn Products Refining Co.

3-METHYLHEXANE

C_7H_{16} ; $CH_3(CH_2)_3CH_3$; M.W. 100.20; B.P. 91.8°C; Sp.G. 0.6870 (20/4°C); insoluble in water; soluble in alcohol; miscible in ether. Suggested uses: organic synthesis. Availability: laboratory and pilot plant quantities. Phillips Petroleum Co., Special Products Division.

METHYL NADIC ANHYDRIDE

$C_{10}H_{16}O_3$; M.W. 179.180; Sp.G. 1.2358; B.P. 80.2°C; flash point (open cup) 140.2°C; solidification point 12°C; viscosity at 25°C (centipoises) 138.43; neutralization equivalent 89.4; infinite solubility in xylene, benzene, naphtha, acetone; light yellow, simiviscous liquid. Suggested uses: curing agent for epoxy resins (U.S. 2,324,483); intermediate for production of plasticizers, plastics, etc. No particular hazards in the handling of this product have been observed to date. Caution should be observed in handling this material until the degree of hazard under the conditions in which it is used is closely established. Availability: pilot-plant quantities. Allied Chemical & Dye Corp., National Aniline Division.

METHYLOLACRYLAMIDE

$C_4H_7O_2N$; M.W. 101.10; M.P. 78.5-79.0°C; white crystalline solid; soluble in water, 5% sodium hydroxide, 5% hydrochloric acid, and dioxane (when heated); partially soluble in ethyl acetate or acetone when heated; insoluble in toluene, benzene and heptane. Undergoes polymerization and reactions typical of the methylol and vinyl groups. Suggested uses: in the preparation of coatings; adhesives; soil conditioner; dispersing agents; resins; binders; crosslinking agents in conventional emulsion polymerizations; anti-static agents; flame-retardants. Availability: laboratory quantities. American Cyanamid Co.

2-METHYLPENTANOIC ACID

$CH_3CH_2CH_2CH(CH_3)COOH$; M.W. 116.17; Sp.G. 0.9242 at 20/20°C; B.P. 196.4°C (760 mm); water-white color; solubility in water 1.3% by weight at 20°C. Undergoes reactions typical of organic acids. The alpha-methyl substitution gives added thermal stability to esters. Suggested uses: intermediate for synthetic lubricants, plasticizers, vinyl stabilizers, metallic salts, non-yellowing alkyl resins. Availability: research quantities. Carbide and Carbon Chemicals Co., division, Union Carbide and Carbon Corp.

2-METHYL-1-PENTANOL

$CH_3CH_2CH_2CH(CH_3)CH_2OH$; M.W. 120.18; Sp.G. 0.8252 at 20/20°C; B.P. 148.0°C (760 mm). Solubility in water 0.31% by weight at 20°C; completely soluble in most common organic solvents. Water-white color. Chemical properties: undergoes reactions typical of alcohols. The alpha-methyl substitution gives added stability to esters. Suggested uses: chemical intermediate for plasticizers, synthetic lubricants, mining chemicals, oil additives, surface active agents; for solvent applications. Availability: research quantities. Carbide and Carbon Chemicals Co., division, Union Carbide and Carbon Corp.

2-METHYLPENTENE-1

$\text{CH}_2=\text{C}(\text{CH}_3)\text{C}_2\text{H}_5$; M.W. 84.16; liquid B.P. 60.7°C; M.P. -135.76°C; R.I. 1.3915 (20/D); Sp.G. 0.6817 (20/4°C). Suggested uses: organic synthesis. Grades: research (99.76%); pure (99%). Availability: laboratory and pilot-plant quantities. Phillips Petroleum Co., Special Products Division.

TRANS-4-METHYLPENTENE-2

C_7H_{14} : $\text{CHCH}(\text{CH}_3)_2$; M.W. 84.16; B.P. 58.55; M.P. -140.81°C; Sp.G. 0.6686 (20/4°C); R.I. 1.3889 (20/D); M.P. -134.43°C. Suggested uses: organic synthesis. Grades: research (99.53%). Availability: laboratory quantities. Phillips Petroleum Co., Special Products Division.

N-METHYL PIPERAZINE

$\text{HNCH}_2\text{CH}_2\text{N}(\text{CH}_3)\text{CH}_2\text{CH}_2$; M.W. 100.16; Sp.G. 0.9140 at 20/20°C; B.P. 136°C (760 mm); clear liquid. Suggested uses: pharmaceutical intermediate of interest in the manufacture of antihistamines, tranquilizing drugs, and motion sickness remedies. Availability: commercial quantities. Carbide and Carbon Chemicals Co., division, Union Carbide and Carbon Corp.

1-METHYL-2-PYRROLIDONE

$\text{CH}_3\text{NC}_4\text{H}_6\text{O}$; colorless liquid; M.W. 99; Sp.G. 1.027 (25/4°C); B.P. 202°C (760 mm); miscible with water and most organic solvents; non-toxic; non-corrosive; stable; easy to recover; low fire hazard. Suggested uses: solvent for acrylonitrile polymers and co-polymers, acetylene, sugars, agricultural chemicals; spinning solvents for synthetic fibers. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

N-METHYLAURINE 22 AND 55

Intermediates used in the manufacture of detergents, dyestuffs, pharmaceuticals and other organic chemicals. N-Methylaurine 22 (M.W. 139) is a 27% active liquid shipped in bulk quantities. N-Methylaurine 55 (M.W. 139) is a 55% active homogeneous slurry pourable above 70°F, packed and sold in drum quantities. Availability: commercial quantities. Antara Chemical Sales Division, General Aniline & Film Corp.

β-MONOALLYL ITACONATE

$\text{CH}_2\text{C}(\text{COOH})\text{CH}_2\text{COOCH}_2\text{CHCH}_2$; M.W. 170.16; M.P. -38-39°C; soluble in ether, chloroform, methanol, ethanol and acetone; slightly soluble in water; insoluble in hexane. May be polymerized to hard, brittle thermoset polymers. Copolymerization with other monomers induces cross-linking. Suggested uses: polymerization to give thermoplastic polymers which can be converted to thermoset resins; copolymerization with other vinyl monomers such as styrene. Availability: experimental quantities. Chas. Pfizer & Co., Inc.

MGK REPELLENT 11 (2,3,4,5-BIS

(2-BUTYLENE)-TETRAHYDROFURFURAL

Sp.G. 1.21 at 20°C; R.I. 1.5262 at 25°C; color (Gardner Scale), 9. Suggested uses: in cattle sprays, household sprays, industrial sprays, and pressurized sprays as a repellent for cockroaches, mosquitoes, flies, gnats, and ants. Availability: commercial quantities. McLaughlin, Gormley King Co.

MONOSODIUM CYANAMIDE

NaNHCN ; M.W. 50.02; crystalline solid; very soluble in water; soluble in methanol; very slightly soluble in ethanol; readily forms dihydrate. The cyanamide radical reacts readily with a wide variety of organic compounds, e.g., amines, alcohols, aldehydes, etc. Suggested uses: chemical intermediate; excellent source of cyanamide radical. Availability: pilot-plant quantities. American Cyanamid Co.

MUREXIDE

$\text{C}_8\text{H}_6\text{O}_2\text{N}_4\cdot\text{H}_2\text{O}$; F.W. 302.216. Available in the reagent grade with a color sensitivity control. It finds special attention in the titrimetric and spectrophotometric determination of calcium and hence in the determination of water hardness. The solution of murexide below pH 9 is red-violet in color and above pH 9, blue-violet. A red complex forms with calcium ion. Availability: commercial quantities as a laboratory reagent. J. T. Baker Chemical Co.

NINATE 411

Oil-soluble alkyl aryl sulfonate; very light color. Used as an emulsifier for kerosene in solvent emulsion degreasers where greasy soils are to be washed off equipment, floors, etc. Availability: commercial quantities. Ninol Laboratories, Inc.

NINEX 23

High-viscosity liquid detergent, suitable as a base for shampoo concentrates that can be diluted as much as sixteen times while still retaining good viscosity and lather. Blend of alkylolamides and sulfonates. Availability: commercial quantities. Ninol Laboratories, Inc.

TERT-NONYL MERCAPTAN

$\text{C}_{10}\text{H}_{19}\text{SH}$; M.W. 159; Sp. G. 0.8578 60/60°F; mercaptan sulfur 19.61% by weight; mercaptan purity 97.3% by weight. Suggested use: chemical intermediate. Availability: laboratory and pilot plant quantities. Phillips Petroleum Co., Special Products Division.

NULLAPON® NaFe-12

Technical sodium ferric ethylenediamine tetraacetate containing 13% iron as Fe and 18.5% iron as FeO . This iron chelate is used to correct iron deficiency in many field and ornamental crops. Controls iron chlorosis of citrus and certain other crops growing in acid soils. Before applying this product to the soil, it must be mixed with sand, fertilizer or other suitable diluent; undiluted, it may cause injury to foliage or fruit. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

NUOSEPT

A non-toxic, non-irritating preservative designed especially for latex paints. At very low concentrations, it prevents bacterial spoilage of the protective colloid. Availability: commercial quantities. Nuodex Products Co.

NUOSTABE V-12

A barium zinc metallic-organic compound, used in conjunction with an epoxy plasticizer to impart good heat and light stability to vinyl compounds. Vinyl compositions stabilized with it are characterized by their complete freedom from sulfur staining. Availability: commercial quantities. Nuodex Products Co.

1-OCTENE (1-OCTYLENE; 1-CAPRYLENE)

$\text{CH}_3(\text{C}_2\text{H}_4)_7$; M.W. 112.21; liquid B.P. 121.27°C; M.P. -101.74°C; R.I. 1.4087 (20/D); Sp. G. 0.71492 (20/4). Suggested uses: organic synthesis. Grades: research (99.67%). Availability: laboratory and pilot-plant quantities. Phillips Petroleum Co., Special Products Division.

OCTYLPHENYL ACID PHOSPHATE

A mixed mono- and dihydrogen phosphate ester containing varying amounts of polyphosphates. Sp. G. 1.080 at 65°C; M.P. 65°C; typical acid number 200 (mg KOH/g); F.P. 290°F and fire point 375°F (Cleveland Open Cup); light tan semi-solid; soluble in ethanol, acetone, benzene, toluene, and hexane; insoluble in water.

Strongly acidic and forms salts with alkalies and amines. Suggested uses: catalysts in curing of urea-formaldehyde resins; rust inhibitor; external mold lubricant for resins; amine salts as antistatic agents for non-cellulosic fibers; leather tanning; reclaiming of rubber; soldering flux; wetting agent for cutback asphalt; and as a flameproofing plasticizer. Availability: commercial quantities. Virginia-Carolina Chemical Corp.

DI-TERT-OCTYL POLYSULFIDE

$\text{C}_8\text{H}_{15}\text{S}_x$; Sx C_8H_{15} ; M.W. 320; Sp. G. 1.0754 60/60°F; sulfur 42% by weight; black color. Suggested uses: polymerization inhibitor, flotation agent, miticide, solvent, cutting oil. Availability: laboratory and pilot plant quantities. Phillips Petroleum Co., Special Products Division.

OIL NEROLI BIGARADE PETALE SYNTHETIC #25402

This synthetic oil is an adequate replacement for the natural oil. It has been tested in both perfumes and flavors and can be freely used instead of the more costly natural product. Availability: commercial quantities. Fritzsche Brothers, Inc.

OP-825-70 BECKOSOL

A long oil drying alkyd resin designed for the formulation of odorless, high gloss interior enamels with exceptional gloss retention and package stability. Its use in formulations results in enamels with good color retention, even under extreme exposure conditions. Availability: commercial quantities. Reichhold Chemicals, Inc.

OPE-16

$\text{C}_6\text{H}_{17}-\text{C}_6\text{H}_4-(\text{OCH}_2\text{CH}_2)_{16}\text{OH}$; 70% solution in water; Sp. G. 1.080 (25/25°C); cloud point above 212°F; hydrophilic surface-active agent. Suggested uses: whenever a water-soluble non-ionic is required, particularly in aqueous medium of high salt content or for use at high temperature. Availability: commercial quantities. Rohm & Haas Co.

OPE-20

$\text{C}_6\text{H}_{17}-\text{C}_6\text{H}_4-(\text{OCH}_2\text{CH}_2)_{20}\text{OH}$; 70% solution in water; Sp. G. 1.088 (25/25°C); cloud point above 212°F; hydrophilic surface-active agent. Suggested uses: whenever a water-soluble non-ionic is required, particularly in aqueous medium of high salt content or for use at high temperature. Availability: commercial quantities. Rohm & Haas Co.

OPE-30

$\text{C}_6\text{H}_{17}-\text{C}_6\text{H}_4-(\text{OCH}_2\text{CH}_2)_{30}\text{OH}$; 70% solution in water; Sp. G. 1.095 (25/25°C); cloud point above 212°F; hydrophilic surface-active agent. Suggested uses: whenever a water-soluble non-ionic is required, particularly in aqueous medium of high salt content or for use at high temperature. Availability: commercial quantities. Rohm & Haas Co.

ORANGE CONCENTRATE TENFOLD #25530

This product was developed as an orange concentrate having good shelf-life without a sacrifice in flavor. It can be used in the cloudy-type orange drink beverage with exceptionally fine results. Availability: commercial quantities. Fritzsche Brothers, Inc.

ORTHOCLEAR BINDERS 55-1 AND 55-2

Plasticized nitrocellulose lacquer binders used in the finishing of leather. Availability: commercial quantities. Rohm & Haas Co.

ORTHOCLEAR HIGH GLOSS FINISH 615

A high gloss nitrocellulose lacquer used as a top coat in leather finishing. Availability: commercial quantities. Rohm & Haas Co.

o-TOLUNITRILE

$\text{CH}_3\text{C}_6\text{H}_4\text{CN}$; M.W. 117.14; Sp. G. 0.998 at 15/15; B.P. 205.2°C (760 mm); light yellow

*Registered trademark.

liquid, insoluble in water; soluble in alcohol and ether; M.P. (pure) -13 C; F.P. (technical) -15 C; assays 95-99% nitriles; 90-98% ortho isomer. Nitrile group reactive via hydrolysis, condensation, and alcoholysis. Suggested uses: in synthesis of resins, dyestuffs. Availability: pilot-plant quantities. Tennessee Products & Chemical Corp.

P32-ADENOSINE TRIPHOSPHATE

Labeled in all three phosphate groups. Supplied as the crystalline disodium salt, chromatographically homogeneous. Suggested uses: in biochemical and medical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

PAN

$C_{15}H_{11}ON_3$; F.W. 249.277. Available in the reagent grade and with a color sensitivity control. It forms intensively colored complexes that are weaker than those of the corresponding complexes with Eriochrome Black T; for example, alkaline earths do not react. The titrations can be carried out in weakly acidic solution so that the direct determination of heavy metals such as copper, cadmium, and zinc and of indium and scandium is possible in the presence of alkaline earths. PAN is also used in the back-titration of many of these metals, and recent developments using PAN with trace copper ion have increased the indicator possibility of this reagent. Color reactions of PAN have been studied for the spectrophotometric determination of zinc, copper, nickel, and cobalt and as detection tests for various metals. Availability: commercial quantities as a laboratory reagent. J. T. Baker Chemical Co.

P-978-60 BECKOSOL

An alkyl resin made with coconut oil, developed for the formulation of baking enamels and cellulose lacquers. Initial color and gloss and color retention properties are advantageous in the formulation of both clear and pigmented finishes. Available: commercial quantities. Reichhold Chemicals, Inc.

P-999-60 BECKOSOL

A drying oil alkyl resin developed for use with amine resins in production of low viscosity, high solids automotive; and industrial enamels, or with medium oil alkyls in the production of air drying enamels. Pigment compatibility and good drying characteristics provide enamels of good durability. Available: commercial quantities. Reichhold Chemicals, Inc.

P-931-60 BECKOSOL

A non-drying oil alkyl resin developed for use with amine resins in the production of low viscosity, high solids enamels with durability and gloss and uniform hardness over a wide range of baking cycles. Availability: commercial quantities. Reichhold Chemicals, Inc.

N-PELARGONOYL-P-AMINOPHENOL (SUNOXON-S*)

$C_{15}H_{23}NO_2$; M. W. approximately 249; white to off-white powder. Suggested uses: as an antioxidant in synthetic rubbers, other polymers and industrial compounds requiring stabilization against oxygen and ultraviolet. Availability: semi-commercial quantities. Sumner Chemical Co., Inc.

PENCO ALDRIN E-4

An emulsifiable concentrate containing 4 pounds technical aldrin per gallon, for control of certain insects on field crops. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENCO DDT S-3

A solvent concentrate containing three pounds DDT (actual) per gallon, for manufacture of field-strength solutions. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENCO DDT 20-40 COTTON DUST

20% DDT, 40% sulfur. A blended field-strength

dust to be used for heavy bollworm infestation on cotton. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENCO 2-20-40 COTTON DUST

A field-strength cotton dust containing 2% gamma isomer of BHC, 20% DDT, and 40% sulfur. For control of cotton insects, especially bollworms. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENCO DEFOLIANT 1098

A water-miscible liquid cotton defoliant containing 3 pounds butynediol per gallon. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENCO DIELDRIN W-50

A wettable powder containing 50% Dieldrin, for use as a seed treater. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENCO GRANULAR 2% DDT

A granular insecticide containing 2% gamma isomer BHC, for control of some soil insects. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENCO GRANULAR 5% DDT

A new granular insecticide containing 5% DDT, for control of corn borers. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENCO HEPTACHLOR E-2

An emulsifiable concentrate containing two pounds of heptachlor per gallon, for control of certain insects on field crops. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENCO PENCAL-5% DDT

Field-strength dust containing 67% tricalcium arsenate and 5% DDT, for the control of cotton insects. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENCO PENCAL-5% DDT, 1% PARATHION

Field-strength dust containing 67% tricalcium arsenate, 5% DDT, and 1% parathion, for control of cotton insects. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENCO PENTACHLOROPHENOL

A technical product containing a minimum of 95% of chlorinated phenols. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENCO PENTA CONCENTRATE 40

A 40% solvent concentrate of technical pentachlorophenol designed for use as a harvest aid on crops and as a wood treater. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENCO TRICALCIUM ARSENATE, TECHNICAL

A calcium arsenate concentrate containing 84% tricalcium arsenate, for use in the manufacture of field-strength calcium arsenate. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENNSALT CLEANER F-9

A new alkaline spray cleaner. Nonsilicated for application where silicates should be avoided. Exceptionally good cleaning power. Contains balanced surfactant system; provides maximum detergency with controlled foaming. Designed to prevent scaling in hard water areas. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENNSALT CLEANER F-11

A new alkaline spray cleaner. Low alkalinity

combined with a balanced system of detergents provides cleaning power with low foaming. Designed specifically where it is desirable to avoid high alkalinity such as in phosphating systems. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENNSALT CLEANER K-10

A new electrocleaner designed specifically to eliminate streaking of work when slow transfer times are encountered. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENNSALT STRIPPER X-26

A new paint stripping compound. Alkaline in nature and containing no cresylic acid. Exceptionally rapid stripping rate on most paint films, including epoxy resins. Availability: commercial quantities. Pennsylvania Salt Mfg. Co.

PENTACHLOROBENZENETHIOL

C_6Cl_5SH ; M.W. 282.4; M.P. approx. 235 C; purity, approx. 95%; odor, musty; color, off white; slightly soluble in aromatic hydrocarbons, carbon tetrachloride; insoluble in water, petroleum ether. Reactivity of mercapto group similar to other aromatic thiols; chlorines not labile. Suggested uses: synthesis of insecticides and other agricultural chemicals, antioxidants, etc. Availability: pilot-plant quantities. E. I. du Pont de Nemours & Co., Inc., Dyes and Chemicals Division.

PENTANOIC ACID

$C_5H_{10}COOH$; a mixture of 5-carbon acids consisting of approximately 55-65% n-valeric acid, 35-45% 2-methylbutyric acid, and less than 5% 3-methylbutyric acid; M.W. 102.13; Sp. G. 0.9379 at 20/20 C; distillation range 179-187 C (760 mm); color, water-white; odor, penetrating. Undergoes reactions typical of organic acids. Suggested uses: intermediate for plasticizers, pharmaceuticals, metallic salts, vinyl stabilizers; extraction of mercaptans from hydrocarbons. Availability: research quantities. Carbide and Carbon Chemicals Co., division Union Carbide and Carbon Corp.

n-PENTANOL

$C_5H_{12}O$; M.W. 88.15; Density 0.8144 at 20/20 C; B.P. 138 C (760 mm); solubility in water, 2.7% by weight at 22 C; color, water-white; odor, mildly fruity. Undergoes reactions typical of normal alcohols. Suggested uses: intermediate for pharmaceuticals, plasticizers, synthetic lubricants, mining chemicals, corrosion inhibitors, wetting agents. Availability: research quantities. Carbide and Carbon Chemicals Co., division, Union Carbide and Carbon Corp.

PEPTON® 65 PLASTICIZER

Zinc 2-Benzamidothiophenolate; M.W. 522.0; Sp. G. 1.32; melting range 205-230 C; practically odorless, grayish-white powder. Exhibits excellent catalytic peptizing of natural rubber and some synthetic polymeric hydrocarbons at temperatures as low as 150 F. Suggested uses: mastication of rubber hydrocarbon on open mills and early-stage breakdown of R.H.C. in direct banbury compound mixing. Availability: commercial quantities. American Cyanamid Co., Specialty Products Dept.

PERMA KLEER 50 ACID

Chemically pure ethylene diamine tetra acetic acid. M.W. 292; fine, white crystals; bulk density 0.68; pH, aqueous solution, 2.0; solubility in water, 0.02 grams per 100 grams water; % acid (precipitation method) 98.5 minimum; mgs. calcium carbonate chelated per gram of acid, 342; residue on ignition, 0.03%; heavy metals, 5 ppm maximum. Suggested uses: for preparation of special salts and chelates. Availability: commercial quantities. Refined Products Corp.

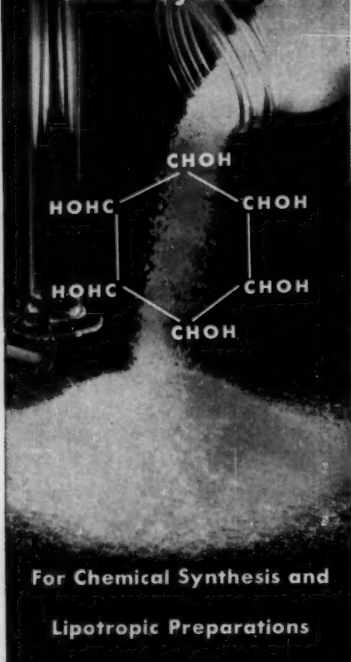
PERMA KLEER 50 CRYSTALS

Tetrasodium salt of ethylene diamine tetra acetic acid. Clear, non-hygroscopic crystals; bulk density 0.72; pH (1% solution) 10.8; solubility in water, 123 grams per 100 grams water; mgs. calcium carbonate chelated per gram of sequestant, 228. Product forms stable chelates with all divalent metal ions and with most trivalent

*Registered trademark.

Staley's®

Products from Corn
and Soybeans



INOSITOL N. F.

Inositol N. F. is a product that holds great promise, not only for medicine, but for many fields of industry.

A recognized member of the B-Complex vitamin group, it has several applications in the pharmaceutical industry. It is used either alone or with certain vitamins, as a lipotropic agent. The six hydroxyl groups in the Inositol molecule lend themselves to esterification and ether formation. It is also used in chemical synthesis.

You can depend on Staley, one of the leading corn processors and chemical manufacturers, to supply your needs for a high grade, pure Inositol compound. At your request, Staley will be glad to send complete data, or to meet with you to discuss your Inositol requirements.

For information about other Staley products; Lecithin, Leucine, Phytic Acid, Inositol, Tyrosine, MSG, HVP, Calcium Phytate, Amino Acid Mixtures, Corn Steep Liquor and Fermentation Nutrients, write:

1906 **50** 1956
ANNIVERSARY
A. E. Staley Mfg. Co.
DECATUR,
ILLINOIS



C W Report

metal ions. Ferric ion is chelated in acid and neutral media. Suggested uses: for sequestering calcium, iron, magnesium, and other metal ions which may interfere in textile or industrial processes. Availability: commercial quantities. Refined Products Corp.

PERMA KLEER 50 CRYSTALS, DISODIUM SALT

Disodium salt of ethylene diamine tetra acetic acid dihydrate. M.W. 372; clear, non-hygroscopic crystals; bulk density 0.82; solubility in water, 11 gms per 100 gms water; pH (1% solution) 5.0; mgs. calcium carbonate chelated per gram of sequestant, 270. Product forms stable chelates with all divalent metal ions. Suggested use: for sequestration of metal ions in solutions where a pH value higher than 5 cannot be tolerated. Availability: commercial quantities. Refined Products Corp.

PERMA KLEER 50 CRYSTALS, TRISODIUM SALT

Trisodium salt of ethylene diamine tetra acetic acid trihydrate. M.W. 412; clear, non-hygroscopic crystals; bulk density 0.72; pH (1% solution) 8.4; solubility in water, 60 grams per 100 grams water; mgs. calcium carbonate chelated per gram sequestant, 240. Product forms stable chelates with all divalent metal ions. Suggested uses: for sequestration of metal ions in soaps, detergents and cosmetic preparations. Availability: commercial quantities. Refined Products Corp.

PERMA KLEER 80 CRYSTALS

Sodium salt of mixed hydroxy alkyl ethylene diamine tri acetic acid. Clear, non-hygroscopic crystals; bulk density 0.72; pH (1% solution) 10.5; solubility in water, 160 gms. per 100 grams water; mgs. calcium carbonate chelated per gm. of sequestant, 240. Product forms stable chelates with all divalent metal ions, and with ferric ions. Suggested uses: sequestration of iron in either acid or alkaline medium, as well as calcium and magnesium in textile, cosmetic, pharmaceutical and general industrial uses. Availability: commercial quantities. Refined Products Corp.

PERMANSA ORANGE H. D-3166

A new dry color made for use in dual tinting systems which are designed for tinting both oil and water paint systems. The vehicle is compatible either on the basis of its solubility or emulsifying properties in both water and oil paint systems. This color has relatively good light resistance and good alkali resistance. Specific gravity 1.43; bulking value 0.08396 gal. per lb.; weight per solid gal., 11.91 lb. Suggested use: in dual tinting systems. Availability: commercial quantities. Pigment, Color and Chemical Division, The Sherwin-Williams Co.

PERTHANE 75% SOLUTION

A solution of 75% Perthane (p p' diethyl diphenyl 2,2-dichloroethane) in methylene chloride. An insecticide concentrate for use in pressurized mothproofers, household aerosols and liquid sprays. Highly effective against clothes moths, carpet beetles and flies. Extremely low in mammalian toxicity, both oral and percutaneous. Imparts no tackiness to sprayed woollens and leaves no visible deposit on dark colored materials. Availability: commercial quantities. Rohm & Haas Co.

PHENYL ACID PHOSPHATE

A mixed mono- and dihydrogen phosphate ester containing varying amounts of polyphosphates; Sp. G. 1.284 at 48°C; M.P. 48°C; typical acid number 360 (mg KOH/g); F.P. 255°F; fire

point 375°F (Cleveland Open Cup); light tan solid; soluble in ethanol, acetone, benzene, toluene; partially soluble in water; insoluble in hexane. Strongly acidic and forms salts with alkalies and amines. Suggested uses: catalysts in curing of urea-formaldehyde resins; rust inhibitor; external mold lubricant for resins; amine salts as anti-static agents for non-cellulosic fibers; leather tanning; reclaiming of rubber; soldering flux; wetting agent for cutback asphalt; and as a flameproofing plasticizer. Availability: commercial quantities. Virginia-Carolina Chemical Corp.

DIPHENYLETHYL SULFIDE

(C₆H₅)₂C₂H₄)₂S; Sp. G. 1.0427 60/60°F; flash point by COC 305°F; sulfur 12.67% by weight; mercaptan sulfur 0.50% by weight. Suggested uses: chemical intermediate, solvent. Availability: laboratory and pilot-plant quantities. Phillips Petroleum Co., Special Products Division.

BIS (PHENYL) SULFONE

(C₆H₅)₂SO₂; M.W. 218.3; white crystalline solid; M.P. 124-128°C; B.P. 378°C; slightly soluble in hot water; soluble in ethyl ether, benzene and hot ethanol. Can be nitrated, sulfonated, but is resistant to hydrolysis or reduction. Suggested use: chemical intermediate. Availability: research quantities. Stauffer Chemical Co., Market Development Dept.

PHILPRENE® VP POLYMERS

A line of synthetic polymers which contain 2-methyl-5-vinylpyridine. The three polymers making up the family are: VP-15, an 85/15 butadiene/2-methyl-5-vinylpyridine copolymer; VP-25, a 75/25 butadiene/2-methyl-5-vinylpyridine copolymer; VP-A: a 70/10/20 butadiene/2-methyl-5-vinylpyridine/acrylonitrile terpolymer. The polymers, available as 55 Mooney (ML-4) gum stocks, may be compounded conventionally to produce compounds similar to those based on butadiene/styrene rubber, or they may be compounded in the presence of active organic halides to produce oil-resistant compounds exhibiting outstanding combinations of properties. In both compounding systems, the polymers are reinforced highly with carbon black or inorganic reinforcing agents such as the clays and silicas. This flexibility in compounding permits the "tailoring" of compounds to satisfy specific applications requiring unique combinations of oil resistance, low-temperature flexibility and excellent dynamic properties. The polymers have good tack and adhesive properties which suggest their application in adhesives and protective coatings in addition to application in vulcanized goods. Availability: limited commercial quantities. Phillips Chemical Co.

PHOSPHONITRILIC CHLORIDE

(PNC₂)₃. Refined grade: white crystals, approximately 75% trimer and 25% tetramer. Technical Grade: dark, paste, consisting of higher polymers. By removal of the chlorine atoms, condensation takes place with any compound containing a reactive hydrogen atom; polymerization occurs by heating to 250 to 300°C. Suggested uses: temperature resistant, flame-proof coatings and binders for glass, ceramics, asbestos and metals; lubricant additive; intermediate for making specialty polymers. Availability: commercial quantities. Millmaster Chemical Corp.

PHTHALALDEHYDIC ACID

C₈H₄C₂H₂O₃; M.W. 151.1; M.P. 97-98.6°C; soluble in water, 3.05% at 25°C; in ether 12.3% at the same temperature; tan to white crystals. Undergoes many reactions analogous to those of an acid anhydride and many of the reactions of an organic acid and aldehyde. Availability: experimental quantities. Dow Chemical Co.

PINANE HYDROPEROXIDE

C₁₀H₁₈O₂; M.W. 170.24; Sp. G. 1.0166 at 15.56°C/15.56°C; B.P. 56°C at 0.04 mm; insoluble in water; soluble in common organic solvents; refractive index n_D²⁰ = 1.4855; viscosity, Gardner 1933 H-1 (206-232 centipoises at 25°C); pale yellow liquid. Stable compound; may be reduced with sodium sulfide. Suggested uses: as a peroxide-type catalyst; intermediate. Availability: laboratory quantities. American Cyanamid Co.

*Registered trademark.

PIPERAZINE

(CH₂)₄N₂H₂; M.W. 86.1; F.P. 110 C; solubility in water, 25% at 250 C; in methanol 120% and in ether 1.3% at the same temperature; white crystalline solid with a characteristic amine odor undergoes the usual reactions of a secondary amine. Suggested uses: intermediate in the preparation of anthelmintics, antihistamines, anti-motion sickness drugs, tranquilizers, fibers, plasticizers, etc. Availability: semi-commercial scale. Dow Chemical Co.

PIPERAZINE TECHNICAL

A white, low-melting eutectic containing approximately 37% water; M.P. approx. 35 C; flash point (open cup), 185 F. Suggested uses: raw material for the manufacture of salts useful as anthelmintics; intermediate for resins, rubber chemicals, dyestuffs, and surfactants. Availability: commercial quantities. Carbide and Carbon Chemicals Co., a division of Union Carbide and Carbon Corp.

PLASTICIZER 136

An alkyl aryl hydrocarbon of particular interest as a secondary plasticizer for vinyl resins. Sp. G. 15.5/15.5 C 0.883; viscosity, 8.4 cps at 25 C; R.I. (n/d) 1.4935 at 20 C; acid number (mg KOH) 0.12; flash point (open cup) 280 F; mild, sweet odor; clear, pale yellow color. Its low cost, low specific gravity and low viscosity suggest its use in sheeting, dry-blend and plastisol formulations at concentrations up to 30 per cent of the total amount of plasticizer used. Blends of Plasticizer 136 with standard primary plasticizers such as "ELASTEX" 28-P Plasticizer (DOP) confer to vinyl sheeting formulations good low temperature and electrical properties with only a slight sacrifice in plasticizing efficiency and permanence. Such blends also show good color stability upon exposure to elevated temperatures. Also, blends of Plasticizer 136 and DOP yield non-bridging, sandy dry-blends under standard mixing conditions. Availability: commercial quantities. Barrett Division, Allied Chemical & Dye Corp.

PLIOBOND H.T.

A thermocuring adhesive designed specifically for applications where a fast-curing type adhesive is required which will resist elevated temperatures and not "creep" under constant load. Suggested uses: assembly of mechanical and electronic equipment which will be subjected to high temperatures. Availability: commercial quantities. Chemical Division, The Goodyear Tire & Rubber Co.

PLIOFLEX 1006

An improved, hot, non-extended, butadiene-styrene rubber with light color characteristics which processes easily and permits more exacting color work in the manufacture of light-colored rubber products. Availability: commercial quantities. Chemical Division, The Goodyear Tire & Rubber Co.

PLIOFLEX 1773

A cold, oil masterbatch butadiene-styrene rubber containing 25 parts of naphthenic oil. Protected during manufacture with non-staining, non-discoloring stabilizers. Suggested uses: in the manufacture of white sidewall tires, hospital sheeting, shoe soles and heels. Availability: commercial quantities. Chemical Division, The Goodyear Tire & Rubber Co.

PLIOFLEX 1778

A cold, oil masterbatch butadiene-styrene rubber containing 37.5 parts of naphthenic oil. Protected during manufacture with non-staining, non-discoloring stabilizers. Suggested uses: in the manufacture of white sidewall tires, colorful toys and housewares, and hospital sheeting. Availability: commercial quantities. Chemical Division, The Goodyear Tire & Rubber Co.

PLIOLITE LATEX 150 (HIGH SOLIDS)

An emulsion polymer of butadiene and styrene which is made at 45% solids concentration. The latex is made using an ammonia soap type of stabilizer, resulting in good water resistance upon drying. Applicable as an additive in heat sealable natural-GR-S latex foams, adhesives,

and as a modifier for natural-GR-S rug backing and textile coating compounds. Availability: commercial quantities. Chemical Division, The Goodyear Tire & Rubber Co.

PLIOLITE LATEX 170 (HIGH SOLIDS)

This emulsion polymer of butadiene and styrene is made at 45% solids concentration using a volatile ammonium soap emulsifier. The latex forms a continuous film at room temperature and provides excellent water resistance. Stronger films are produced by heating to 250-300 F and are characterized by abrasion and chemical resistance, as well as high gloss and excellent anchorage. The latex in combination with microcrystalline wax gives successful results as a paper coating, and finds use as a sealer for wood, plastic and floorings. Availability: commercial quantities. Chemical Division, The Goodyear Tire & Rubber Co.

PLIOLITE RUBBER LATEX 2000

A copolymer of butadiene and styrene, reacted at a temperature of 150 F and consequently known as a "hot polymerized latex." Reaction is terminated at 90% conversion, resulting in a latex with medium solids content of 39-42%, and a particle size smaller than that of natural latex. Suggested uses: beater impregnation of paper, impregnation of fabrics. Availability: commercial quantities. Chemical Division, The Goodyear Tire & Rubber Co.

PLIOLITE RUBBER LATEX 2001

A medium solids latex containing a 50/50 ratio of butadiene and styrene. Reaction is carried out at 150 F and the product is consequently known as a "hot polymerized latex." Reaction is terminated at 90% conversion with total solids content of 37-39%. Suggested uses: coatings and saturants in the paper and textile industries. Availability: commercial quantities. Chemical Division, The Goodyear Tire & Rubber Co.

PLIOTAC

A contact adhesive with good bond strength, excellent tack, low level dry film odor, remains permanently flexible after application. Suggested uses: joining any combination of plywood, plastic, fiberglass, foam rubber, natural fiber textiles, metals, plaster, concrete and ceramics. Availability: commercial quantities. Chemical Division, The Goodyear Tire & Rubber Co.

PLYAMUL 9350

An all-purpose polyvinyl acetate emulsion with many applications in the adhesive, textile and paper industries. It is supplied in two viscosity grades: 900-1200 cps, and 1500-1900 cps. Availability: commercial quantities. Reichhold Chemicals, Inc.

POLARIS RED, CP 1285

Bright, exceptionally blue-shade red pigment with definitely improved light resistance compared to other non-bleeding azo reds. Sp. G. 1.56; bulking value 0.07698 gal. per lb.; weight per solid gal. 12.99 lbs. Suggested uses: in printing inks, plastics, and rubber. Availability: commercial quantities. Pigment, Color and Chemical Division, The Sherwin-Williams Co.

POLYARYL POLYISOCYANATE (PAPI-1)

Low molecular weight polymer of average M.W. 384; average isocyanate groups per molecule 3.03; soluble in anhydrous organic solvents; dark-amber viscous liquid. Isocyanate groups react with materials containing activated hydrogen atoms. Suggested uses: in polyurethane coatings, adhesives and foams both rigid and flexible, and as a resin modifier. Availability: semi-commercial quantities. The Carwin Co.

POLYBUTADIENE (BUTAREZ®)

Liquid. Sp. G. 0.9083 60/60 F; ash 0.05 wt. %; viscosities 1500 and 2500 SFV at 100 F. Suggested uses: smokeless paint or varnish additive, casting resin, electrical insulation. Availability: commercial quantities. Phillips Petroleum Co., Special Products Division.

POLYBUTYLENE GLYCOLS

HO(C₄H₈O)_nC₄H₉OH; available in the following molecular weights: 500, 1000, 1500,

MEET Nitromethane



for process and product improvement

Nitromethane is one of four versatile Nitro-paraffins now available in commercial quantity for industry. This new chemical family is believed to hold more promise for process and product advancement than any other chemical group developed in the past twenty-five years. Learn how the NP's may be of help in improving your present product or in creating new products.

write:

**COMMERCIAL
SOLVENTS Corp.**

260 MADISON AVE.

NEW YORK 16, N. Y.



Branches in principal cities

*Registered trademark.

SEBACIC ACID

**HARCHEM
SEBACIC ACID
IS A**

PURE CHEMICAL

**suitable for your
most exacting
developments**



Outstanding for

**High Temperature
Stability**

Built-in Flexibility

**Maximum Light
Resistance**

**so essential to High Poly-
mer Plasticizers, Synthetic
Lubricants, and production
of your other high quality
products.**

Write for further information

H-9

HARCHEM DIVISION
WALLACE & TIERNAN INC.
25 MAIN STREET, BELLEVILLE 9, N. J.
IN CANADA: W. C. Hardesty Co. of Canada, Ltd., Toronto

C W Report

2000; pour points from -10 F for M.W. 500 to 0 F for M.W. 2000; Sp. G. 0.974 for M.W. 500, to 0.967 for M.W. 2000; soluble in H₂O, < 0.1% at 25 C; infinitely soluble in methanol and ether at the same temperature; viscous liquids. Suggested uses: as oil additives and polyurethane foam intermediates. Availability: experimental quantities. Dow Chemical Co.

POLYEPICHLOROHYDRIN

HO(C₂H₄ClO)_nC₂H₄ClOH; available in the following average molecular weights: 450, 900, 1150; pour points from 21 F for M.W. 450, to 51 F for M.W. 1150; Sp. G. at 25/25 C 1.299 for M.W. 450, to 1.328 for M.W. 1150; soluble in water < 0.1% at 25 C; soluble in methanol and ether < 100% at the same temperature; viscous liquids. Suggested uses: as intermediates in the preparation of non flammable products. Availability: experimental quantities. Dow Chemical Co.

POLYGLYCOL E 20,000

HO(C₂H₄O)_nC₂H₄OH; polyethylene glycol having an average molecular weight of 20,000; freezing range, 54-58 C; Sp. G., 1.001 at 25/25 C; infinitely soluble in water at 25 C; soluble in methanol and ether, 12% and < 0.1% respectively at the same temperatures; hard, tough, solid. Suggested uses: foam rubber mold release agent; ironing aid when added to laundry starch; water soluble binder for textile and paper starch sizes; suspending agent. Availability: semi-commercial quantities. Dow Chemical Co.

POLYLITE 8050

A rigid-type polyester resin whose good electrical, chemical-resistant and high heat resistance properties make it useful as an impregnant, binder and sealant, and adaptable to matched die, pre-mix and lay up molding. Availability: commercial quantities. Reichhold Chemicals, Inc.

POLYLITE 8100

A highly light-stable polyester resin especially recommended for production of corrugated and flat translucent and opaque paneling of highest quality. It affords strength, durability, heat resistance, good color and light stability, and fast gel and cure with low levels of hydroperoxides at moderate temperatures. Availability: commercial quantities. Reichhold Chemicals, Inc.

POLYLITE 8120

A flexible-type polyester resin developed for blending with rigid-type polyesters to impart increased resiliency and resistance to impact or shock. Featuring a low styrene content, it blends with both low and high viscosity type polyesters. Availability: commercial quantities. Reichhold Chemicals, Inc.

POLYLITE 8166

A general purpose polyester resin for use in casting, matched die and lay-up molding, and as a formulating resin for resilient gel coats. It has good wetting properties, high impact and shock resistance combined with good strength and rigidity, and is resistant to cracking and crazing. Availability: commercial quantities. Reichhold Chemicals, Inc.

POLYLITE 8180

A styrene modified polyester resin designed for pre-mix compounding and matched die molding.

It has exceptional impact strength, resiliency and hot strength, and cures rapidly. Availability: commercial quantities. Reichhold Chemicals, Inc.

POLYLITE 8181

A vinyl toluene modified resilient polyester resin designed for pre-mix compounding and matched die molding. It features low volatility of monomer as compared to styrene modified resins, exceptional impact strength, hot strength, and fast curing properties. Availability: commercial quantities. Reichhold Chemicals, Inc.

POLYLITE 8400

A diallyl phthalate modified polyester resin for general purpose usage. It is a high viscosity rigid-type resin and is designed for curing at elevated temperatures, but has catalyzed stability at room temperatures, and is non-volatile. Availability: commercial quantities. Reichhold Chemicals, Inc.

POLYLITE 8601

A polyester resin for the production of rigid polyurethane foams possessing good strength-to-density ratios, good dimensional stability and low heat transmission properties. Suggested uses: foamed-in-place insulation and flotation as well as pre-foamed blocks or slabs. Availability: commercial quantities. Reichhold Chemicals, Inc.

POLYLITE 8651

A polyester resin for the production of flexible polyurethane foams possessing low density, medium firmness and excellent ageing properties. Availability: Commercial quantities. Reichhold Chemicals, Inc.

POLYSTYRENE GLYCOLS

HO(C₆H₅C₂H₃O)_nC₆H₅C₂H₃OH; available in the following average molecular weights: 500, 750; pour points, 75 F for M.W. 500, 150 F for M.W. 750; Sp. G. at 25/25 C, 1.136 for M.W. 500, 1.152 for M.W. 750; soluble in water, < 0.1% at 25 C, in methanol and ether > 100% at the same temperature; viscous liquids. Suggested uses: as an intermediate for surfactants incorporating the hydrophobic phenyl group. Availability: experimental quantities. Dow Chemical Co.

POLYVINYLPIRROLIDONE (PVP)

(CH₂CHNC₄H₅O)_n; white amorphous powder; density 3.2-3.5 lbs./gal.; soluble in water and most organic solvents. Binder, film former, stabilizer, dispersing agent for pigments, drug vehicle and retardant, detoxicant. Precipitates tannins and polycarboxylic acids; prevents soil redeposition; substantive to hair. Suggested uses: Cosmetics, glass fibers, textiles, detergents, inks, paints, lithography, waxes and polishes, beverage clarification, pharmaceuticals, veterinary medicine. Availability: K-30 (M.W. 40,000) commercial quantities; other grades under development, available on a semi-commercial scale. Antarg Chemicals Sales Division, General Aniline & Film Corp.

"PONSOL"® DIRECT BLACK PC DOUBLE PASTE

An anthraquinone-type vat dye which produces deep, rich shades of black on either cotton or rayon after oxidation with sodium perborate or sodium bichromate and acetic acid. The product is particularly recommended for package dyeing and for pigment application to piece goods by pad-jig or by the Du Pont Pad-Steam Continuous Dyeing Process. It is especially useful where good fastness to peroxide bleaching, washing and chlorine is required. Availability: Commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Chemicals Division.

"PONSOL"® GRAY N DOUBLE PASTE

An anthraquinone vat dye that produces bluish-gray to black shades on cotton and rayon. It is of particular interest for making medium gray to charcoal gray shades for dress goods, shirtings, industrial uniform materials or other uses requiring good fastness to light, chlorine, washing and other color-destroying influences. This dye becomes somewhat duller under yellow incandescent light but remains on tone and is superior in this respect to other vat dyes currently in use for producing similar

*Registered trademark.

shades. It is especially recommended for dyeing piece goods by pad-jig techniques or the Du Pont Pad-Stear Continuous Dyeing Process. It can also be applied satisfactorily in heavy shades (above 5.0%) to yarn in package machines by pigmentation followed by reduction and dyeing at 140–160° F. Availability: Commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Chemicals Division.

"PONTAMINE"® FAST BLUE ML

A fast-to-light direct dye particularly suited to the production of shades on cotton and rayon that show good resistance to the effects of resin treatments. Light to medium gray shades with good lightfastness that show only negligible staining of nylon effects can be produced with this new blue shaded with other resin-fast direct dyes. Because of its good build-up properties it is suitable for the production of charcoal gray and navy shades. Concentrations above 1.0% are not recommended in these heavy shades, particularly where nylon reserve is of paramount importance. Availability: Commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Chemicals Division.

"PONTAMINE"® WHITE BTS CONCENTRATE

A water-soluble fluorescent textile whitening agent, especially recommended for application to cotton and rayon in the form of yarns, knit goods and woven fabrics. It exhibits a strong greenish-blue fluorescence and has very good fastness to washing, discharge printing, peroxide bleaching, and has lightfastness equal to that of other whitening agents. The product can be applied at any temperature, although its greatest tictorial effectiveness is in the temperature range of 130–200° F. Availability: commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Chemicals Division.

POTASSIUM IODATE A.R. PRIMARY STANDARD

KIO₃; F.W. 214.01; pure white, crystalline powder; controlled for trace impurities according to the requirements of the A.C.S.; assayed precisely within narrow limits (99.95–100.05%). Suggested uses: in standardizing thiosulfate, as a standard in acidimetry, in the determination of many inorganic and organic substances. Availability: laboratory quantities. Mallinckrodt Chemical Works.

POTASSIUM METHYL SULFATE

KCH₃OSO₃·½H₂O; M.W. 159.2; white crystals; soluble in water; pure grade. Suggested use: organic syntheses. Availability: laboratory scale. City Chemical Corp.

PRASEODYMIUM OXIDE

Pr₂O₃; M.W. 1021.52; insoluble in water; soluble in acids; black color; salts are colored green; one of the rare earth oxides. Suggested uses: glass coloring, catalyst. Availability: 99% and 99.9% purities, pilot-plant scale. Lindsay Chemical Co.

PRIMAL WHITE 336

The new white pigmented aqueous dispersion used in conjunction with acrylic resin binders in the finishing of leather. Availability: commercial quantities. Rohm & Haas Co.

PRINTING GUM 5952

A natural gum-based cold-water-soluble print thickener for Rapidogen, Indigosols, aniline-black, vat flash ageing. Availability: commercial quantities. Morningstar, Nicol, Inc.

PRINTING GUM 9243

A natural gum-based cold-water-soluble print thickener used at high solids content. Used for printing silk and synthetic fibers. Availability: commercial quantities. Morningstar, Nicol, Inc.

PROPARGYL ALCOHOL

C₃H₃O; colorless liquid; M.W. 56, Sp. G. 0.948 (25/4C.); B.P. 115° C. (760 mm); miscible with water, ethanol, ethyl ether, acetone, benzene, chloroform, dioxane, pyridine; immisc-

ible with aliphatic hydrocarbons three centers of reactivity: primary hydroxyl group, active hydrogen and triple bond. Suggested uses: inhibitor for hydrogen embrittlement and corrosion by strong mineral acids; stabilizer for halogenated compounds; intermediate for sulfadiazine and other pharmaceuticals, agricultural chemicals, textile auxiliaries, plasticizers, essential oils. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

PROPARGYL BROMIDE

C₃H₃Br; colorless liquid; M.W. 119; Sp. G. 1.567 (25/4C.); B.P. 84° C. (760 mm); three centers of reactivity: active halide, active hydrogen and triple bond. Suggested uses: soil fumigant; intermediate for synthesis of pharmaceuticals (propargyl amines, ethers and substituted barbiturates; hormones, morphine antagonists and vitamin A). Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

2-PROPYL-1-HEPTANOL

C₉H₁₉CH(C₃H₇)CH₂OH; M.W., 158.28; Sp. G., 0.8327 at 20/20° C; distillation range: 216.3 to 218.9° C (760 mm); water-white color. Undergoes reactions typical of alcohols. The *n*-propyl substitution gives added stability to esters. Suggested uses: defoamer; dispersant for pigments and clays; solvent medium; intermediate for plasticizers, diester lubricants, oil additives, and textile lubricants. Availability: research quantities. Carbide and Carbon Chemicals Co., Division, Union Carbide and Carbon Corp.

DI-*n*-PROPYL MALEATE

M.W. 200.23; boiling range 245–248° C; Sp. G. 1.0213 at 25° C; R. I. 1.4428 at 20° C. Availability: commercial quantities. New York Quinine & Chemical Works, Inc.

PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE)

(CH₃)₃C₆H₃; M.W. 120.186; liquid B.P. 168.169° C; M.P. –61° C; insoluble in water; soluble in alcohol, benzene, ether. Suggested uses: in making dyes and perfumes. Grades: research (99.6%), pure (99.4%), technical (95+%). Availability: laboratory and pilot plant quantities. Phillips Petroleum Co., Special Products Division.

PVP-IODINE

Polyvinylpyrrolidone combined with iodine. Reddish brown amorphous powder. Soluble in water and many organic solvents. Essentially non-toxic, non-irritating, non-staining. Effective germicide. Suggested uses: pharmaceuticals and veterinary products, sanitizers, agricultural pesticides. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

PYROCATECHOL VIOLET

C₁₀H₆O₇S; Can be employed for the detection of the end-point in the titration of a large number of metal ions. It has special advantages as a metal indicator in that it permits the relatively specific chelatometric titration of bismuth and thorium in strongly acid media. The dye finds use as a detection agent, especially in paper chromatography for a number of polyvalent metals. It may be used in the colorimetric determination of bismuth, thorium, copper, and of fluoride. It has also been applied as a redox indicator in bromatometric and cerimetric determinations and also as a metal indicator in the direct titration of cyanide ion with nickel salts. Availability: in commercial quantities as a laboratory reagent. J. T. Baker Chemical Co.

PYROLUX MAROON, D-3148

A new organic maroon pigment especially developed for the plastics industry with excellent permanence and exceptional resistance to discoloration due to heat. Sp. G. 1.84; bulk value 0.06523 gal. per lb.; weight per solid gallon 15.33 lbs. Suggested uses: in plastics or any other material where heat and light resistance are major requirements. Availability: commercial quantities. Pigment, Color and Chemical Division, The Sherwin-Williams Co.

Another Example of Why

ACE GLASSWARE PRODUCTS

Are the First Choice of

Discriminating

Research Personnel

ACE TRUBORE® STIRRER

Featuring the Closest Tolerances



for
the most
efficient
laboratory
stirring

Accurate tests of this combination of Trubore Bearing and Full-length Precision-ground Glass Rod show an average leak rate of 6.4 mm. Hg./min. (unlubricated) at 760 mm. differential pressure. For Lubricated stirrers, leakage is less than 0.05 mm. Hg./min. for the same pressure differential.

Teflon Blades (also available in Glass). Interchangeable Precision Bearing and "Flex-Grip" Chuck assure perfect alignment. Precision-ground glass rod for ALL Flasks ranging from 50 ML to 5 Liter capacity.

In addition to standard items, Ace specializes in Custom-fabricating Glassware to your specifications.

Ace Products are also carried in stock at our Louisville Warehouse.

Write for Ace Catalog "50" and Supplement No. 1 showing the exceptionally wide range of Ace Products.



ACE GLASS INCORPORATED

KYRELAND & NEW JERSEY
LOUISVILLE, KY. 40201 SOUTH HAVEN, CT 06488
Glassware Specialists to Industry and Research

*Registered trademark.

BAKER PROCESSING CHEMICALS...

*"...we have found we can depend
on J. T. Baker for
defined purity and physical
uniformity lot after lot."*

EVERY DAY A DAZZLING RIVER OF GLASS

flows from the melting tanks of Corning. Glass for science—
glass for industry—glass for the home.

In fact, (as Corning writes in their letter opposite), more than 65,000
formulas are known to them. The development and production of these
special glasses calls for ingredient chemicals made to exact standards of purity.

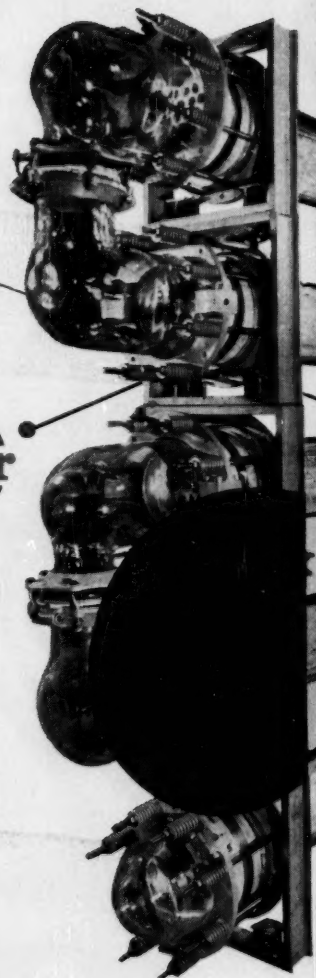
Your production techniques may, of course, have little in common with Corning.
But when they say, *"Over the years we have found we can depend on
J. T. Baker for defined purity and physical uniformity lot after lot,"* the principle
behind the choice of Baker high purity tonnage chemicals remains the same.

Would you, for example, like to simplify your process? Improve your product?
Eliminate one or more purification steps? Save valuable testing time?

Baker Purity by the Ton may be the answer.

You see, in Baker you have a reliable source for process chemicals manufactured
to exact standards of purity and uniformity—in tonnage quantities—
at economical prices. And that's because in Baker you have the right combination
of experience, skill, teamwork, personnel and plant.

You can be confident that we will always regard your trademark as precious
as our own—and safeguard it with equal vigilance.



PURITY BY THE TON — FOR P

one of the guardians of this precious trademark



CORNING GLASS WORKS
CORNING, NEW YORK

PURCHASING DEPARTMENT

September 1, 1956

Mr. Warren F. Schumacher,
Sales Manager
Fine & Industrial Chemical Division
J. T. Baker Chemical Company
Phillipsburg, New Jersey

Dear Mr. Schumacher:

We make a variety of types of glass with unusual properties for specialized uses in the scientific and industrial fields. Today, more than 65,000 glass formulae, combining nearly every one of the earth's elements, are known to us. Each year Corning develops new types of glasses for commercial use.

The development and production of these special glasses calls for extremely precise controls. It is essential for us to choose ingredient chemicals made to exact standards of purity.

Over the years we have found we can depend on J. T. Baker for defined purity and physical uniformity, lot after lot. This is very important in our business.

We also appreciate the fine cooperation of your product planning department in keeping an uninterrupted flow of materials coming to us on schedule.

Sincerely yours,

F. D. Clapp,
Assistant Purchasing Agent

FDC:PS

J. T. Baker Chemical Co.

REAGENT



• FINE • INDUSTRIAL

Phillipsburg, New Jersey

PRODUCTION USE

December 15, 1956 • Chemical Week

If a better solvent
would improve your
product...use one!

don't ride a dead horse

Quality—and sales—
can suffer with standard
solvents that aren't *just
right* for your product.
If this is your case, what
can you do? Try East-
ern States where *all* sol-
vents are tailor-made
to exact specifications!

Prompt Delivery

Yes, Eastern States
Chemical not only gives
you fast delivery—but
also assures you highest
quality, purity and ab-
solute uniformity. Don't
YOU "ride a dead
horse." Find out how
Espesol solvents can
help your product.
Mail coupon today!



EASTERN STATES
Chemical
Corporation

ESPESOL

Eastern States Chemical Corp.
Dept. C-12156, P.O. Box 5008
Houston 12, Texas
Phone: Walnut 3-1631

Gentlemen: I would like to know more about
solvents produced by Eastern States.

Name _____

Firm Name _____

Address _____

City _____ Zone _____ State _____

C W Report

PYROTARD BAP EMULSION

A permanent fire-retardant formulation for cotton designed to be used in conjunction with tetrakis-hydroxymethyl phosphonium chloride. Contains 33% solids consisting of bromoform adduct of triallyl phosphate, together with special plasticizers. Availability: commercial quantities. Scientific Oil Compounding Co., Inc.

2-PYRROLIDONE

C_4H_7NO ; colorless liquid; M.W. 85; Sp. G. 1.107 (25/4 C.); B.P. 245 C. (760 mm); miscible with water, ethanol, ethyl ether, chloroform, benzene, ethyl acetate, carbon disulfide; non-toxic, non-corrosive, stable, easy to recover, low fire hazard. Suggested uses: solvent for polymers, chlordanes, DDT, d-sorbitol, glycerine, iodine, sugars; polyamide condensation forms high molecular weight, linear, nylon-like polymer. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

RESINOID BENZOIN SIAM EXTRA

This new product represents an improvement over the regular Resinoid Benzoine Siam. It faithfully and more definitely reproduces the odor and properties of Benzoine Siam. Availability: commercial quantities. Fritzsche Brothers Inc.

β -RESORCYLIC ACID (2,4-DIHYDROXY-BENZOIC ACID)

$C_7H_4O_4$; M.W. 154.12; anhydrous decomposes at 194-200 C.; 0.26 g. soluble in 100 parts water at 17 C.; soluble in alcohol, ether; crystalline. Undergoes reactions typical of phenols and aromatic carboxylic acids. Suggested use: chemical intermediate. Availability: semi-commercial quantities. American Cyanamid Co.

RHONITE 467

An anionic polymeric thermosetting resin for use as a hand builder alone or in conjunction with crease-proofing resins. It produces durable, crisp finishes and a considerable degree of dimensional stability, thus imparting various hand modifications to textile fabrics. Availability: commercial quantities. Rohm & Haas Co.

RHOPLEX E-23

A soft, aqueous dispersion of an acrylic polymer developed for back-coating. It is anionic, of low viscosity, can be used alone or with fillers; particularly applicable as a binder for upholstery fabrics as it possesses excellent flexibility without tackiness and does not stiffen or discolor with aging. Availability: commercial quantities. Rohm & Haas Co.

RHOPLEX WN-77

A non-ionic thermoplastic resin dispersion used alone or in conjunction with thermosetting resins for the development of a durable, full, firm hand in fabric finishing. Availability: commercial quantities. Rohm & Haas Co.

ACID RUBEANIC A.R.*

Dithiooxamide; $NH_2-CS-CS-NH_2$; F.W. 120.2; orange-red to dark orange, crystalline powder; controlled to assay at least 99.0%. A complexing agent which reacts with a number of metallic ions to form colored, insoluble rubeanates. Suggested uses: in spot tests, colorimetric methods of analysis and paper chromatography; an extremely sensitive reagent for copper. Availability: semi-commercial quantities. Mal-linckrodt Chemical Works.

SAMARIUM OXIDE

Sm_2O_3 ; M.W. 348.86; insoluble in water; soluble in acids; pale cream color. One of the rare earth oxides. Suggested uses: thermal neutron absorber, activator in catalysts and phosphors. Availability: 99% and 99.9% purities, pilot-plant scale. Lindsay Chemical Co.

SANTICIZER 213

Modified phthalate; relatively harmless toxicity; plasticizer grade purity; soluble in organic solvents. Outstanding features: ability to reduce tack, improve gloss and lower initial plastisol viscosities. Suggested uses: as a plasticizer for polyvinyl chloride in coated cloth, dip-molded and slush-molded objects and extrusions to minimize surface tack. Availability: experimental and semi-commercial quantities. Monsanto Chemical Co., Organic Chemicals Division.

SERENE GREEN, D-3116

A medium-deep green shade pigment with improved dispersion properties. Suggested uses: in vinyl resins, asphalt, tile, linoleum, rubber and polyethylene as well as other miscellaneous plastics. Availability: commercial quantities. Pigment, Color and Chemical Division, The Sherwin-Williams Co.

SETAMOL® DA

A new assistant for use in alkaline and neutral wet finishing of stock or yarn-dyed woolen and worsted fabrics. It is a liquid form product which is stable to hard water, and to acid and alkali in concentrations normally encountered in wool processing. In finishing tweeds, plaids, checked fabrics, etc., when added to the fulling solution, it prevents staining and discoloration caused by transfer of dyestuff from dark shade dyed fibers to white or pale shade effects. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline and Film Corp.

"SEVRON" BRILLIANT RED B

A bright bluish-red cationic dye suitable as a selfshade and in combination with other "Sevron" dyes to produce a wide range of shades that possess good light and wetfastness properties. Has only little affinity for nylon and moderate affinity for acetate and silk. Availability: commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Chemicals Division.

"SEVRON"® ORANGE G

A cationic dye which produces bright, yellow-orange shades that possess very good fastness to light and wet processing. This product has good affinity for nylon, acetate and silk but is inferior in fastness properties to the dyes normally applied to these fibers. Availability: commercial quantities. E. I. du Pont de Nemours Co., Inc., Dyes and Chemicals Division.

SKIN PACKAGING ADHESIVES

Three solution adhesives, ARCCOS 2070-8A, 2097-40 and 2070-7A, available for cellulose acetate, cellulose acetate butyrate and vinyl films. A strong bond which is non-blocking at 120 F is provided after quick sealing at moderate temperatures. Availability: commercial quantities. The Borden Co., Chemical Division, Resinous-Reslac Dept.

SOCCHI #6618

A combination fungicidal and bactericidal formulation designed for emulsion application to textiles. Used in conjunction with proper resin emulsions, a treatment resistant to repeated

*Registered trademark.

laundings can be obtained. Availability: commercial quantities. Scientific Oil Compounding Co., Inc.

SODIUM ISOASCORBATE

$C_6H_7O_6Na$; M.W. 196.12; white to light yellow color; similar to isoscorbic acid. Suggested uses: as an antioxidant in foods, beverages, industrial compounds and photographic materials. It is more stable than the corresponding acid. Availability: commercial quantities. Sumner Chemical Co., Inc.

SODIUM ISOASCORBATE (SODIUM-D-ISOASCORBATE, SODIUM ARABOASCORBATE)

$C_6H_7O_6Na \cdot H_2O$; M.W. 216.13; solubility in water, 15% at 25°C; white crystalline powder; mildly saline taste. Suggested uses: as an antioxidant primarily for food products; in the meat industry to provide greater color retention in processed meat products; in carbonated and still beverages to protect color and flavor; for protecting color and flavor in frozen fruits; in beer to inhibit oxidative flavor changes. No vitamin C activity. Availability: commercial quantities. Chas. Pfizer Co., Inc.

SODIUM TOLUENE SULFONATE

Sodium Toluene Sulfonate, a hydrotrope, is available as a 40% active liquid and as an 85% active powder. Used extensively as a conditioning and anti-blocking agent in built synthetic detergents. Reduces the tendency of the detergent to block or cake in high humidity due to moisture pick-up. Rate of solubility of detergent is increased considerably by its addition. Has numerous applications in various liquid detergents, particularly those containing inorganic phosphates as a solubilizer and coupling agent. Availability: commercial quantities. Ultra Chemical Works, Inc.

SODIUM XYLENE SULFONATE

Sodium Xylene Sulfonate, a hydrotrope, is available as a 40% active liquid and as an 85% active powder. A mixture of the sulfonates of all three isomeric xylenes, as well as ethylbenzene, to produce a hydrotrope with high solubility at low temperatures and in high concentrations of phosphate solutions. Suggested uses: in heavy duty liquid detergents as a coupling agent and solubilizer to permit the formulation of liquid containing substantial quantities of sodium or potassium phosphates; as a solubilizer, or cloud point depressor, in light duty liquid detergents; in spray dried soaps or detergents as a solubilizer, conditioner, or anti-blocking agent. Availability: commercial quantities. Ultra Chemical Works, Inc.

SOFTREZ 9226

Water dilutable emulsifier of softeners used with thermosetting resins. Produces a soft, full hand and increases abrasion resistance and tear strengths. Unaffected by solvents and laundering. Availability: commercial quantities. Morn-ingstar, Nicol, Inc.

SOLIDOGEN® LT-13

A liquid, cationic resinous-type fixing agent which improves the wet and wash fastness of cotton or rayon fabrics and yarns dyed with direct colors; applied as a self-product or in combination with copper salts. In leather processing, it produces wash-fast suedes, promotes uniform and level dyeing. In the paper trade, it minimizes the bleeding of acid color calendar stains. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

SOLVENTS, SPECTRO GRADE

Types: n-Hexane. Various solvents useful in different wavelength ranges. Suggested uses: as optically clear solvents for dilution of spectrometer samples. Availability: laboratory quantities. Phillips Petroleum Co., Special Products Division.

*Registered trademark.

SOROMINE® AL

A new amphoteric softener in the form of a smooth white paste which improves the sewing and napping qualities of fabrics and yarns. Dispersible in warm or hot water. Imparts excellent softening and lubricating effects on cellulosic, synthetic and animal fibers and can be applied on all types of textile processing equipment, i.e., pads, jigs, package machines, dye becks, etc. Availability: semi-commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corporation.

STABILIZED ROSIN (GALEX PELLETS)

A new form of modified free-flowing rosin. Acid number 152; saponification number 157; light amber color. Suggested uses: surgical and pressure-sensitive adhesive tapes; rubber compounds. Availability: commercial quantities. G & A Laboratories, Inc.

STEARIC HYDRAZIDE

$C_{17}H_{35}CONHNH_2$; M.W. 298.50; M.P. 115-116°C; insoluble in water and ethanol, soluble in hot benzene; fine white powder. Suggested uses: lubricant-deoxidant in the production of stronger and cleaner powdered metallurgical parts. Availability: experimental quantities. Olin Mathieson Chemical Corp., Industrial Chemicals Division.

STEAROXYACETIC ACID

M.W. 342.30; acid number 136; M.P. 57-59°C. Availability: commercial quantities. New York Quinine and Chemical Works, Inc.

STEARYL ACID PHOSPHATE

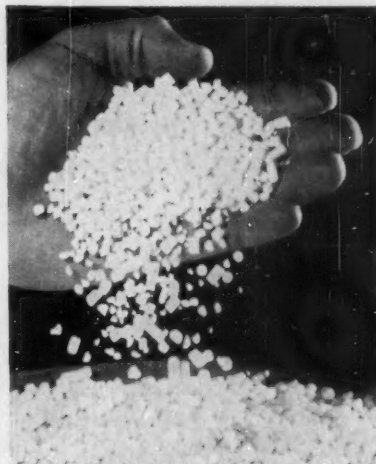
A C_{16} - C_{18} mixed mono- and dihydrogen phosphate ester containing varying amounts of polyphosphates; Sp. G. 0.896 at 67°C; melting point 67°C; typical acid number 165 (mg KOH/g); flash point 440°F; fire point 455°F (Cleveland Open Cup); light tan, waxy solid; soluble in benzene, toluene; partially soluble in hexane; insoluble in water, ethanol, and acetone. Strongly acidic and forms salts with alkalis and amines. Suggested uses: as a catalyst in curing of urea-formaldehyde resins; rust inhibitor; external mold lubricant for resins; amine salts as anastatic agents for non-cellulosic fibers; leather tanning; reclaiming of rubber; soldering flux; wetting agent for cut-back asphalt; and as a flameproofing plasticizer. Availability: commercial quantities. Virginia-Carolina Chemical Corp.

STRAWBERRY IMITATION #24989

A superior imitation flavor, duplicating the aroma of freshly picked, sun-ripened berries. While especially suited for use in confections and jellies, it is also excellent for ice creams, beverages, confectioner's icings, gelatin desserts and soft drink powders. Availability: commercial quantities. Fritzsche Brothers Inc.

STRONTIUM DICHROMATE, TECHNICAL TRIHYDRATE

$SrCr_2O_7 \cdot 3H_2O$; M.W. 357.70; small bright red crystals, deliquescent in moist air; very soluble in water, with hydrolysis to the insoluble chromate at elevated temperatures; insoluble in carbon tetrachloride, ethers and hydrocarbons; the crystal starts to lose water at 100°C, going to the anhydrous salt below 220°C. Suggested uses. As a water-soluble additive in chemical and electrochemical processes for controlling the concentration of sulfate ions. May be useful in metal primers, in slushing, pipe-joint and caulking compounds; in anti-corrosive paper and gasket materials; in recirculating water systems where the presence of strontium might be desirable to build up protective films; as a catalyst, or starting material for catalyst manufacture; as a modifier for fungicides, insecticides and preservatives. Availability: pilot-plant quantities. Allied Chemical & Dye Corp., Mutual Chemical Division.



Flows freely after
months of storage!

DU PONT

PELLETIZED

SODIUM NITRITE

One order will show you that Du Pont's new *pelletized* form of sodium nitrite puts an end to all caking problems. These cylindrical pellets resist moisture pickup and remain free-flowing even after months of storage—and *they're not contaminated by any anti-caking agents.*

Easier handling is only part of the story. You can save on storage space, too, because the bulk density of pelletized sodium nitrite is about 15% higher than that of the granular form. So contact the jobber or sales office nearest you and your order will be on its way.

This handy booklet contains full details on stock points, availability, storage, and toxicity. For your copy write: E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.



DU PONT
SODIUM NITRITE



Better Things for Better Living... through Chemistry



*Talk
about
Prompt
Shipments!*

Try Diamond on Chlorinated Solvents!

Tank cars, drums or cans—DIAMOND delivers orders fast! METHYLENE CHLORIDE (Dichloromethane) shipments, for example, are always on time. DIAMOND METHYLENE CHLORIDE has an Underwriters' nonflammable rating under ordinary heat. Use it, up to 60 C., in the presence of air, water and light.

DIAMOND'S METHYL CHLORIDE (Chloromethane) resists oxidation up to 200 C. Fine thermal stability. Little decomposition below 400 C. in the absence of air and water. Comes in tank cars only as liquefied gas under pressure.

Get technical grade CHLOROFORM from DIAMOND, too. In tank cars, drums or cans. U.S.P. grade in drums or cans. Use both with common construction materials up to 120 C.

DIAMOND makes technical grade CARBON TETRACHLORIDE, fire extinguishing fluids and grain fumigants, and also custom blends of chlorinated solvents for special applications. Order in drums or tank cars.

Another DIAMOND solvent—PERCHLOROETHYLENE—is outstanding for metal degreasing as well as dry cleaning. Its pleasant, unique odor and ease of recovery help make it popular.

Put DIAMOND's chlorinated solvents line-up to work for you. Simply phone your nearby DIAMOND sales representative. Or write DIAMOND ALKALI COMPANY, 300 Union Commerce Building, Cleveland 14, Ohio.



**Diamond
Chemicals**

C W Report

SUCCINAMIDE

$C_4H_5O_2N_2$; M.W. 115.12; M.P. 258-259 C.; white needles; solubility 0.5g./100 g. water at 15 C; 11.0 g./100 g. water at 100 C; insoluble in absolute alcohol, ether. Chemical properties: forms salts; can be hydrolyzed by acids or bases; can be dehydrated to succinonitrile; heating at 200 C forms succinimide; reacts with formaldehyde. Suggested uses: formation of resins; chemical intermediate. Availability: laboratory quantities. American Cyanamid Co.

4,4'-SULFONYL DIBENZOIC ACID

$(HOOC-C_6H_4)_2 SO_2$; M.W. 306.29; M.P. over 300 C; white, crystalline solid; free flowing; very stable; non-hygroscopic; only slightly soluble in water or the common organic solvents such as alcohol, acetone, acetic acid, benzene, or nitrobenzene; appreciably soluble in dimethylformamide, dimethylsulfoxide or pyridine. Forms salts and esters like other aromatic acids. Suggested uses: in the synthesis of dyes, pharmaceuticals, etc., and in preparation of polyester resins and fibers. Availability: experimental quantities. Allied Chemical & Dye Corp., General Chemical Division.

NO. 3094 SUPER-BECKACITE

A pure phenolic fast-bodying oil-soluble resin developed for the production of durable water- and chemical-resistant varnishes with rapid drying characteristics. High viscosity and good color result from its use in both cooks and blends. No strong solvents are required for thinners. Available: commercial quantities. Reichhold Chemicals, Inc.

NO. 3555-60 SUPER-BECKAMINE

An aromatic solvent-soluble melamine-formaldehyde resin developed for the production of low-viscosity, high-solids metal finishes possessing excellent hardness, gloss and chemical resistance. Availability: commercial quantities. Reichhold Chemicals, Inc.

SUPER SANTOFLEX

N-phenyl-N'-cyclohexyl-p-phenylenediamine; 85% minimum purity. Outstanding features: resistance to oxygen and ozone and ozone in rubber, both natural and synthetic; heat resistance and long term aging properties. Suggested uses: as a rubber antidegradant because of its antioxidant, antiozonant, antiflex-cracking, and copper chelating properties. Availability: commercial quantities. Monsanto Chemical Co., Organic Chemicals Division.

SURFACTANT 1711

A general-purpose agent of good wetting action, possessing the advantages of a material in dry form, but being non-dusting in nature. Versatile in application, being used where wetting and emulsifying properties are desired, and it may be used as a utility detergent without addition of any other material. Moderately alkaline in reaction, it has good water solubility, but is not hygroscopic, and keeps well in storage without caking. It is a good dispersing agent for particulate matter, and this property, in combination with wetting and emulsifying power, makes a surface active agent of exceptional balance. Availability: commercial quantities. Victor Chemical Works.

TANGERINE CONCENTRATE FIVEFOLD

Suggested use: when tangerine flavor is desired. The natural qualities of Oil of Tangerine remain intact, while shelf-life is greatly improved. Availability: commercial quantities. Fritzsche Brothers Inc.

TECHNICAL SANTICIZER 41 (Phenyl Paratoluene Sulfonate)

Technical grade; relatively harmless toxicity; M.P. 94C; soluble in organic solvents. Outstanding features: excellent resin compatibility; low-cost solid plasticizer; provides adhesives with excellent tack. Suggested uses: as a plasticizer for polyvinyl acetate adhesives; as a phenylating agent in dyestuff application. Availability: experimental quantities Monsanto Chemical Co., Organic Chemical Division.

TENAMENE 30

A rubber antiozonant containing N,N'-di-2-octyl-p-phenylenediamine which effectively retards the deterioration and cracking of rubber products due to ozone exposure. It was developed to meet the new performance specifications laid down by the Ordnance Department for all rubber products, including tires. It is outstanding in its resistance to heat aging. Availability: commercial quantities. Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Co.

TENAMENE 31

A rubber antiozonant containing N,N'-di-3-(5-methyl)-p-phenylenediamine which effectively retards the deterioration and cracking of rubber products due to ozone exposure. It has been developed to meet the new performance specifications laid down by the Ordnance Department for all rubber products, including tires. Its tendency to accelerate the cure is slightly less than that of N,N'-di-2-octyl-p-phenylenediamine. Availability: commercial quantities. Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Co.

TENOX BHT (Agricultural Grade)

A specially prepared form of butylated hydroxytoluene designed for use by feed manufacturers. Free-flowing, non-dusting and non-caking, it blends rapidly and homogeneously in mixing operations and does not separate during handling or storage. This antioxidant is used primarily in poultry feed formulations to protect vitamin content, improve pigmentation, and safeguard poultry against deficiency diseases such as encephalomalacia. Availability: commercial quantities. Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Co.

TERGITOL® NONIONIC XH

A polyalkylene glycol-ether. White solid; Fr. P. 36-46 C; cloud point (0.5% aqueous solution), 90 C minimum; average weight per gal., 8.66 lbs. at 40 C. Suggested uses: as a component of low-foaming detergent formulations and as an emulsifier for oils, waxes, and agricultural concentrates. Emulsifier, stabilizer, and pigment dispersant in latex formulations. Availability: commercial quantities. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

TETRA-(2-ETHYLBUTYL) SILICATE

$[C_2H_5CH(C_2H_5)CH_2O]_4Si$; M. W. 432.72; Sp. G. 0.8938 at 20/20 C.; R. I. (nd) 1.4291 at 20 C; viscosity 191 centistokes at -65 F and 3.86 centistokes at 100 F; flash point 125 F; fire point, 365 F. Suggested uses: high temperature hydraulic fluids and other functional fluids. Availability: semi-commercial quantities. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

TETRA-(2-ETHYLHEXYL) SILICATE

$[C_4H_9CH(C_2H_5)CH_2O]_4Si$; M. W. 544.92; Sp. G., 0.8838 at 20/20 C.; B. P., 350-370 C. (760 mm.); viscosity, 2.25 centistokes at 210 F., 6.91 centistokes at 100 F., 1320 centistokes at 65 F.; viscosity index, 149; surface tension, 26.7 dynes/cm. at 25 C.; flash point 380 F.

*Registered trademark.

fire point, 460 F.; four point, below -100 F.; freezing point, sets to glass below -90 C. Suggested applications: high temperature hydraulic fluids and other functional fluids. Availability: semi-commercial quantities. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

TETRAMETHYLENEDIAMINE

$\text{H}_2\text{NCH}_2\text{CH}_2\text{CH}_2\text{NH}_2$; M.W. 88.15; M.P. 27°C; B.P. 158-160°C; soluble in water, methanol, benzene; stable to heat; white crystal and/or clear liquid; offensive odor. Undergoes usual reactions of amines and diamines. Suggested uses: chemical intermediate; preparation of synthetic fibers and polymers and amino resins. Availability: laboratory quantities. American Cyanamid Company.

THALLIUM (OUS) PERCHLORATE

TlClO_4 ; M.W. 303.8; grades: CP, technical; white crystals; soluble in water. Availability: laboratory scale. City Chemical Corp.

THULIUM OXIDE

Tm_2O_3 ; M.W. 386.8; insoluble in water, soluble in strong mineral acids; white color with faint green tinge; one of the rare earth oxides. Suggested use: as Tm-170 (after neutron irradiation) in portable X-ray units. Availability: 99.9% purity in pilot plant quantities. Lindsay Chemical Co.

TITANIUM TRICHLORIDE

TiCl_3 ; M.W. 154.3; dark purple solid; particle size 10-100 microns; bulk density 7 to 30 lbs./cu. ft.; purity 99+%; decomposes above 450°C, soluble in water, HCl solutions and ethyl alcohol; insoluble in ethyl ether. Suggested uses: strong reducing agent; catalyst for organic reactions and polymerizations. Availability: research quantities. Stauffer Chemical Co., Market Development Dept.

TOLERON®

Brand of ferrous fumarate, $\text{FeC}_4\text{H}_2\text{O}_4$; F.W. 169.9; reddish-orange to reddish brown powder; odorless; substantially tasteless. Suggested uses: provides a readily available source of ferrous iron which can be used alone or as a constituent of various drug preparations for oral administration. Availability: commercial quantities. Mallinckrodt Chemical Works.

o-TOLUENESULFONYL CHLORIDE

$\text{o-CH}_3\text{C}_6\text{H}_4\text{SO}_2\text{Cl}$; M.P. 10.1°C minimum; B.P. 126°C at 10 mm; 98% minimum purity; insoluble in water; soluble in common organic solvents; extremely stable in the absence of moisture. Suggested uses: as a chemical intermediate. Availability: commercial quantities. Monsanto Chemical Co., Organic Development Division.

p-TOLUENESULFONYL CHLORIDE

$\text{p-CH}_3\text{C}_6\text{H}_4\text{SO}_2\text{Cl}$; 98% minimum purity; M.P. 66.5°C minimum; B.P. 135.5°C at 10 mm; insoluble in water; soluble in common organic solvents; extremely stable in the absence of moisture. Suggested uses: as a chemical intermediate. Availability: commercial quantities. Monsanto Chemical Co., Organic Development Division.

TOXIMULS H & L

Twin insecticide emulsifiers. When blended together in various proportions these emulsifiers impart spontaneity or "flash" to emulsifiable formulations of chlordane, DDT, dieldrin, etc. Blends of nonionics and special sulfonates. Availability: commercial quantities. Ninol Laboratories, Inc.

*Registered trademark.

TOXIMUL MP

Emulsifier for Malathion fly sprays. Gives stable emulsions of Malathion in waters of any hardness. Blend of nonionics and sulfonates. Availability: commercial quantities. Ninol Laboratories, Inc.

TRIALLYL CITRATE

M. W. 312.31; Sp. G. 1.144 at 20/4°C; B. P. 143°C (0.4 mm); R. I. 1.471 (20°C); water immiscible; miscible with acetone, benzene, chloroform, dioxane, ethanol and glacial acetic acid. A highly unsaturated, reactive monomer which may be polymerized to hard, brittle thermoset polymers. Copolymerization with other monomers induces cross-linking. Suggested uses: cross-linking agent for polyester resins prepared from unsaturated acids. Availability: experimental quantities: Chas Pfizer & Co., Inc.

TRIALUMINUM PHOSPHATE

pH of 1% solution 6.5-7.5; solubility 0.5-0.8 g. per 100 g. of 40% slurry; abrasion loss 1.2 to 3.0 mg. of antimony; particle size-5 to 40 microns. Suggested uses: dentifrice polishing agent; ceramics. Victor Chemical Works.

N-TRIDECANE (TRIDECYL HYDRIDE)

$\text{CH}_3(\text{CH}_2)_{11}\text{CH}_3$; M.W. 184.35; liquid B.P. 234°C; M. P. 6.2°C; Sp. G. 0.761 (20/4°C). Suggested use: organic synthesis. Technical grade (95%). Suggested Availability: laboratory and pilot plant quantities. Phillips Petroleum Co., Special Products Division.

1,1,3-TRIETHOXYHEXANE

M. W. 218.33; B. P. 85°C (5 mm); Sp. G. 0.874 at 20/15.6°C. Suggested uses: frother in ore flotation. Availability: Semi-commercial quantities. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

TRIISOCTYL AMINE

$(\text{C}_8\text{H}_{17})_3\text{N}$; M.W. 350.63; Sp. G. 0.819 at 20/20°C; B. P. 134°C (0.1 mm); R. I., (nd), 1.4542 at 20°C; pale yellow color. Suggested uses: a new chemical of value in the extraction of uranium and heavy metals from sulfate leach liquors; has unusually low solubility losses. Availability: semi-commercial quantities. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

TRIMETHYL PHOSPHITE

$(\text{CH}_3\text{O})_3\text{P}$; M.W. 124.08; Sp. G. 1.046 at 20/4°C; B.P. 108-108.5°C; n_D^{20} 1.4076; insoluble in water; penetrating odor; waxy-white color. Reacts with alpha chlorocarbonyl derivatives to form vinyl phosphates; reacts readily with sulfur to form phosphorothioate; reacts vigorously with halogens to form dimethyl phosphorochloridate which is a versatile intermediate for the introduction of phosphate groups into organic molecules; undergoes Michaelis-Arbuzov reaction with primary and secondary aliphatic halides to produce corresponding phosphonates; forms addition compounds with cuprous or silver halide and is oxidizable to the phosphate. Suggested uses: antioxidant and corrosion inhibitor in lube oils; intermediate in preparation of insecticides; additive to E.P. lubes; specially solvent. Availability: commercial quantities. Virginia-Carolina Chemical Corp.

TRITON X-161

An agricultural emulsifier, imparts excellent spontaneity and stability to most pesticide emulsifiable concentrates. Availability: commercial quantities. Rohm & Haas Co.

3,4,5-TRIMETHOXYBENZOIC ACID

$(\text{CH}_3\text{O})_3\text{C}_6\text{H}_2\text{CO}_2\text{H}$; M.P. 167-168°C; white crystals; soluble in hot water, alcohol. Suggested uses: as a pharmaceutical intermediate. Availability: pilot-plant quantities. Electro Organic Corp.

CHECK
AND
RETURN
THIS
LIST
TO
US



For information that will show you how

UCON

Brand

synthetic fluids and lubricants

can do a job better for you.

- ☐Hydraulic fluids
- ☐Safety hydrolubes
- ☐Gear lubricants
- ☐High-temperature lubricants
- ☐Low-temperature lubricants
- ☐Rubber lubricants
- ☐Packing lubricants
- ☐Compressor and Pump lubricants
- ☐Lift-truck lubricants
- ☐Metal-working fluids
- ☐Heat-transfer fluids
- ☐Grease components
- ☐Textile lubricants
- ☐Defoamers and De-emulsifiers
- ☐Cosmetic oils
- ☐Ink and dye diluents
- ☐Leather softeners
- ☐Solvents and Plasticizers
- ☐Chemical intermediates

Better yet! Give us the specific requirements for your job. We'll give you more information on how UCON fluids and lubricants can help you.



CARBIDE AND CARBON CHEMICALS COMPANY

A Division of
Union Carbide and Carbon Corporation **UCC**
30 East 42nd Street New York 17, New York
"Ucon" is a registered trade-mark of UCC.

Mono Laurates Di

of
Diglycol
Ethylene Glycol
Diethylene Glycol
Polyethylene Glycol
Propylene Glycol
Polyoxyethylene
Butoxyethyl
Glycerine

MADE TO MEET YOUR SPECIFICATIONS



THE FLAME AND THE FLASK — SYMBOL OF QUALITY

The C.P. Hall Co.
CHEMICAL MANUFACTURERS

5147 W. 67th Street, Chicago 38, Illinois

AKRON, OHIO

NEWARK, N. J.

CHICAGO, ILL.

LOS ANGELES, CAL.

C W Report

TRIMETHYLALUMINUM AND TRIETHYL-ALUMINUM

(CH₃)₃Al; M.W. 72.0; Sp. G. 0.752 at 20/4°C; B.P. 122°C; M.P. 15°C; heat of combustion, 10,550 cal/g. (C₂H₅)₃Al; M.W. 114.03; Sp.G. 0.84 at 20/4°C; B.P. 194°C; M.P. -52.5°C. Spontaneously flammable in air; reacts violently with water; noncorrosive to mild steel. Suggested uses: chemical intermediates; polymerization catalysts; ignitors and fuels in ram jet and turbo jet engines. Availability: pilot-plant quantities. U.S. Industrial Chemicals Co.

2,3,4-TRIMETHYLPENTANE

(CH₃)₂CH CH(CH₃)₂; M.W. 114.22; liquid B.P. 113.5°C; F. P. -109.2°C; Sp.G. 0.71905 (20/4°C). Suggested uses: organic synthesis. Availability: laboratory and pilot plant quantities. Phillips Petroleum Co., Special Products Division.

TRIPHENYLSULFONIUM CHLORIDE

(C₆H₅)₃S⁺Cl⁻; M.W. 298.8; M.P. 297-298°C; available in 50% aqueous solution only; Sp.G.: 1.14; clear amber liquid, faint benzene odor. Active ingredient soluble in water, chloroform, methylene chloride, etc.; insoluble in hydrocarbons. Forms complexes with most alcohols, glycols and esters, many metal ions, and bromine and iodine; forms soaps with fatty acids; will copolymerize in phenolic resins. Suggested uses: sequestering agent, surface active soaps, humectant, dyeing and finishing of natural and synthetic fibers. Availability: semi-commercial quantities. Stauffer Chemical Co., Market Development Dept.

n-UNDECANE (UNDECYL HYDRIDE)

CH₃(CH₂)₉CH₃; M.W. 156.30; liquid B.P. 195.8°C; F. P. -26.5°C; R.I. 1.4173 (20/D); Sp. G. 0.745 (20/4°C). Suggested uses: organic synthesis. Grades: research (99.33%); pure (99%). Availability: laboratory and pilot-plant quantities. Phillips Petroleum Co., Special Products Division.

URANIUM DIOXIDE (CERAMIC GRADE)†

UO₂; a dark-brown powder screened to pass 20 mesh; crystallites controlled in size range from 1 to 3 microns. Manufactured especially for sintering and pressing into ceramic bodies for use as nuclear reactor fuels. Mallinckrodt Chemical Works.

URANIUM DIOXIDE (HI-FIRED)†

UO₂; dark-brown crystals; particle size ranges from 5 to 100 microns; special grades can be supplied in narrow size ranges. Specifically prepared for use in preparation of "matrix type" reactor fuel elements similar to those used in the Geneva Conference atomic reactor. Mallinckrodt Chemical Works.

URANIUM OXIDE†

U₃O₈; a black powder supplied in -20 mesh particle size with individual crystallites in the range of 1 to 3 microns. Primary use: as a special ceramic additive. May also be used as a secondary analytical standard. Mallinckrodt Chemical Works.

URANIUM TRIOXIDE†

UO₃; orange powder; particle size -20 mesh with individual crystallites in the range of 1 to 3 microns. Specifically prepared as a starting material for preparation of laboratory quantities of many uranyl salts of research interest. Mallinckrodt Chemical Works.

URANYL SULFATE†

UO₂SO₄·XH₂O; yellow crystalline salt; highly soluble in water. Major interest is in its application as a reactor fuel solution in small "water boiler" research reactors. Usually prepared to meet individual reactor specifications. Mallinckrodt Chemical Works.

URIDINE 2':3'-CYCLIC PHOSPHATE, BARIUM

Suggested uses: in biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

UV ABSORBER 24 (2,2'-dihydroxy-4-methoxybenzophenone

C₁₄H₁₂O₄; M.W. 244.24; M.P. 70-71.5°C; B.P. 164-166°C at 1 mm; insoluble in water; soluble in dilute alkali, benzene, carbon tetrachloride, ethyl alcohol, methylethyl ketone, xylene; pale-yellow solid; absorbs radiation throughout the ultraviolet portion of the spectrum. Chemical properties: relatively inert; acidic. Suggested use: light stabilizer for polyvinyl chloride, polyethylene, surface coatings. Availability: laboratory quantities. American Cyanamid Co.

N-VALERALDEHYDE

CH₃(CH₂)₃CHO; M.W. 86.13; Sp.G., 0.8110 at 20/20°C; B.P. 103.4°C; water-white color. Chemical properties: undergoes reactions typical of aldehydes. Suggested uses: as a chemical intermediate; for the preparation of amines for accelerating rubber vulcanization; for modified polyvinylacetate, phenolic, and urea resins. Availability: research quantities. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

N-VALERIC ACID

C₅H₉COOH; M.W. 102.13; Sp.G. 0.9380 at 20/20°C; B.P., 187°C; solubility in water, 3.7 g. per 100 ml. at 16°C; water-white color; penetrating odor. Chemical properties: undergoes reactions typical of normal mono-basic organic acids. Suggested uses: intermediate for flavors, plasticizers, pharmaceuticals, metallic salts, vinyl stabilizers; extraction of mercaptans from hydrocarbons. Availability: research quantities. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

VICTAWET II

A liquid surface-active agent of clear amber color, readily soluble in water to form clear solutions. It is a moderate foamer having a pH of about 7.4 in 1% solution, and is compatible with reasonable concentrations of many salts. It exhibits excellent wetting properties in hard or soft water and in acid or alkaline solutions. It will withstand refluxing in 3% sulfuric acid or 3% sodium hydroxide for 24 hours without significant change in wetting activity. Suggested uses: as an automobile detergent, as a dishwashing detergent, as a wetting agent in fire fighting, and for general applications where effective wetting and good stability are required. Victor Chemical Works.

†These materials are prepared from cascade-grade uranium hexafluoride secured from the U.S. Atomic Energy Commission. Production procedures on normal assay uranium are adjusted to eliminate possible process variations when handling enriched uranium. All of these products can be supplied as normal isotopic assay uranium "prototypes" or as compounds of uranium enriched in the isotope U-235 upon receipt of proper AEC licenses. These compounds are of very high purity to meet the requirements of nuclear reactor fuels.

VINAC WR-20 DM

A homopolymer polyvinyl acetate emulsion modified to provide excellent tolerance for dextrine. Its taste characteristics recommend it highly for use as a vehicle for remountable adhesives for envelopes, paper tapes, decalcomanias, and carton seals. Solids content: 55% to 57%. Availability: commercial quantities. Colton Chemical Co. Division, Air Reduction Co., Inc.

VINAC WR-50

A homopolymer polyvinyl acetate emulsion designed especially for applications where a high degree of water resistance and fast film-forming characteristics are desired. Its pigment binding properties and stability to borates are outstanding. Recommended as a vehicle for paints, textile sizes, paper coatings and adhesives. Availability: commercial quantities. Colton Chemical Co. Division, Air Reduction Co., Inc.

VINYL BUTYRATE

$\text{CH}_2\text{CHOCOC}_2\text{H}_5$; M.W. 114.14; Sp.G., 0.9022 at 20/20 C; B.P. 116.7 C; F. P. -86.8 C; solubility in water, 0.3% at 20 C. Chemical properties: can be homopolymerized, or copolymerized with vinyl esters and acrylic esters by conventional polymerization techniques. Suggested uses: preparation of resins for use as surface coatings, textile sizes, and adhesives. Availability: commercial quantities. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

VINYL DECANOATE

$\text{CH}_2\text{CHOCOC}_{10}\text{H}_{21}$; M.W. 198; Sp.G., 0.871 at 20/20 C; B.P. 92.5-100 C (10 mm). Chemical properties: can be copolymerized with vinyl esters and acrylic esters to yield internally plasticized resins or viscous oils. Suggested uses: preparation of resins for use in surface coatings, textile sizes, adhesives, and oil soluble dispersants. Availability: research quantities. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

VINYL 2-ETHYLHEXOATE

$\text{CH}_2\text{CHOCOC}(\text{C}_2\text{H}_5)_2$; M.W. 170.24; Sp.G. 0.8751 at 20/20 C; B.P. 185.2 C; F. P. sets to glass below -90 C; solubility in water (0.01% at 20 C). Chemical properties: can be homopolymerized, or copolymerized with vinyl esters and acrylic esters by conventional polymerization techniques to yield internally plasticized resins. Suggested uses: preparation of resins for use as surface coatings, textile sizes, and adhesives. Availability: commercial quantities. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

VINYL PROPIONATE

$\text{CH}_2\text{CHOCOC}_2\text{H}_5$; M.W. 100.11; Sp.G., 0.9173 at 20/20 C; B.P., 94.9 C; F. P., -81.2 C; solubility in water 0.82% at 20 C. Chemical properties: can be homopolymerized, or copolymerized with vinyl acetate, higher vinyl esters, and acrylic esters by conventional polymerization techniques. Suggested uses: preparation of resins for use as surface coatings, textile sizes, and adhesives. Availability: commercial quantities. Carbide and Carbon Chemicals Co. Division, Union Carbide and Carbon Corp.

1-VINYL-2-PYRROLIDONE

$\text{CH}_3\text{CHNC}_4\text{H}_7\text{O}$; colorless liquid; M.W. 111; Sp.G. 1.04 (25/4 C); B.P. 96 C (14 mm.). Miscible with water and most organic solvents. Copolymerizes with most vinyl monomers. In copolymer systems, modifies solubility characteristics and properties, such as dye receptivity, complexing action, emulsifying action, adhesiveness. Suggested uses: reinforced plastics, adhesives, coatings, fibers, textile sizes and finishes. Availability: commercial quantities. Antara Chemicals Sales Division, General Aniline & Film Corp.

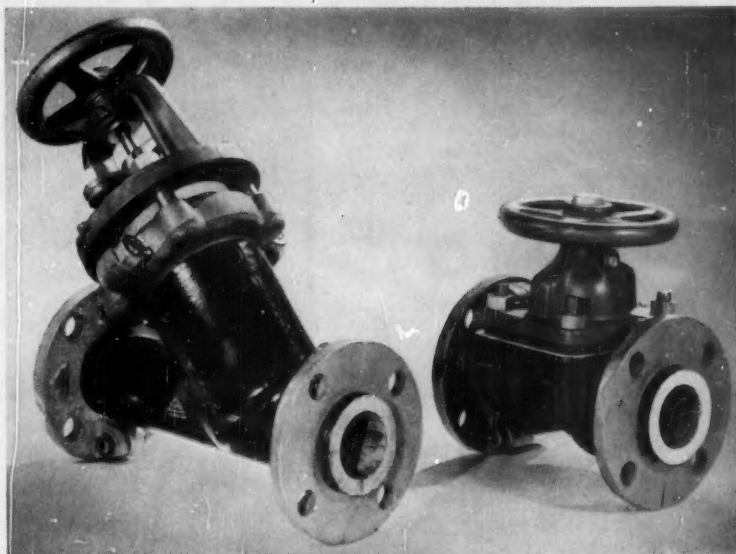
VISCOSITY INDEX ADDITIVES FOR LUBRICATING OIL

A new series of lubricant additives for viscosity



News

Wherever CORROSION RESISTANCE is a Factor



THIS Y-VALVE* SHUTS OUT CORROSION

... because every surface in contact with solution is made of corrosion resistant Haveg plastic! Exceptional moldability and machinability of Haveg permits these additional advantages for longer, corrosion-free valve service:

- Full valve opening for **fuller, straighter flow**!
- Guided stem for **positive seat alignment**!
- Smooth, sliding stem action permits **lower packing pressure—longer packing life**!
- Double threaded stem for **faster valve control**!
- Removable seat and stuffing box for **easy maintenance**!
- Valve seats in full open position and can be re-packed in this position **while in operation**!

Haveg Y-Valves are available in standard pipe sizes, complete with asbestos-graphite unless otherwise specified and can be equipped for easy connection to air, diaphragm or motor-operated control equipment. Discuss your requirements with a Haveg corrosion engineer.

*So does this diaphragm valve—ask for data on it, too.

H-607

HAVEG PLASTICS OF TOMORROW SOLVE YOUR CORROSION PROBLEMS TODAY

HAVEG INDUSTRIES, INC.

920 Greenbank Road, Wilmington 8, Delaware
Factory: Marshallton, Del. phone WYman 8-2271

Atlanta Exchange 3821	Chicago (Wheaton) Wheaton 8-3225	Cleveland Washington 1-8760	Detroit (Livonia) KENwood 1-1785	Houston Jackson 2-6840	Los Angeles MUTual 1105	New York (Westfield, N.J.) Westfield 2-7383	Seattle Main 9006	Denver ELmond 7-9433
--------------------------	--	--------------------------------	--	---------------------------	----------------------------	---	----------------------	-------------------------

How to increase the throughput of a filter

Filter aids are used primarily in systems in which the filterable solids tend to form an impermeable layer of slimes on the filter cloth, thus choking off the flow. Tests have shown the resistance of a cake of filterable sugar solids may be as much as 10,000 times that of a good filter aid filter cake. Filteraids perform the useful function of reducing the resistance, thus increasing the rate of flow through a filter.

There are a number of ways in which throughput can be increased. In general, the coarsest (most permeable) filteraid should be used that will provide a satisfactory degree of clarification. Filtration tests under controlled conditions in the laboratory will determine within a few hours the correct grade of filteraid for any given system.

Second, the filteraid should be used at its optimum concentration. Adding filteraid in increasing increments in any given system, produces very substantial increases in flow up to a certain point. Above this optimum percentage, further increases in flow are much reduced. In fact, in many systems the addition of too much filteraid will result in a definite decrease in throughput.

A third important factor in flowrate is the use of the maximum pressure consistent with the nature of the solids being filtered. Diatomite filteraids usually produce a relatively incompressible cake, so that increases in pressure result in increased flow. However, in a comparatively few systems, usually involving high solids of gelatinous nature, the addition of sufficient filteraid to render the cake incompressible is uneconomic. In these cases the pressure which affords the best balance between economical use of filteraid and the desired throughput should be determined by test.

A fourth method of increasing throughput is ordinarily recommended only under emergency conditions—that is, to "short-cycle" the press. Because the filtration rate of any filtration drops off rapidly as the cake thickness increases, it follows that a higher average filtration rate may be obtained by arbitrarily shutting off the press while the cake is still relatively thin, discharging the cake and starting a new cycle. Short-cycling may actually double the output of any given filter station—BUT—can be accomplished only with increased labor costs. However, it is sometimes useful when changes in process or unusual production requirements demand higher throughput on a temporary basis until additional filtration capacity can be installed.

Because of the influence on filtration rate of a number of process variables that cannot be covered in this brief outline, it is suggested that you insist on good technical service from your filteraid supplier. The services of our experienced filteraid engineers will enable you to secure maximum performance from your filteraid and maximum value for your filteraid dollar.

Paul W. Leppla, Technical Director

All right!

Here's the column we accidentally left out.

In our "Chemical Week" advertisement of September 15th there appeared this statement:—"when sudden peak demands call for a sharp increase in filter output, you can use one of the four ways discussed in the column on the left." Good stuff—*except that we left out the column!*

We've heard so much about that slip that we've decided to run the column by itself. So here it is, and it's worth reading. And if you want the complete story, we'll send you a reprint—ad, chart and column, complete, or better yet, why not write for our Bulletin B-12, General Filtration with Dicalite Filteraids!

write today to

Dependable
GREAT LAKES
Dicalite
DIATOMACEOUS MATERIALS
DICALITE DIVISION,
GREAT LAKES CARBON CORPORATION,
612 SOUTH FLOWER ST.,
LOS ANGELES 17, CALIF.

C W Report

index improvement. These additives are light-colored, viscous, oil soluble polymers useful in compounding premium-quality lubricating oils. Outstanding stability to the shearing breakdown of automobile and diesel engine service is claimed, as well as attractive treating costs for viscosity index adjustment. These additives impart pour depressing properties to permit easy starting of engines and pouring of treated oils at subzero temperatures. The additives are solutions in a carrier oil. Availability: commercial quantities. Olin Mathieson Chemical Corp., Industrial Chemicals Division.

NO. 822 VISCOSITY STABILIZER

For corrugators. A hydrophilic colloid that controls and maintains viscosity of starch adhesives. It occludes free water and speeds production. Improves application through better control of spread, and eliminates starved glue lines. Saves starch by reducing quantity required in carrier. Availability: commercial quantities. Morningstar, Nicol, Inc.

VISCOTROL A

A finely divided, white synthetic wax. This additive is designed to impart thixotropic body to paints, inks and related materials. When incorporated as part of the pigment grind, it will control sagging, aid leveling, reduce penetration and lend excellent brushing characteristics to many types of coatings. In addition, Viscotrol A increases storage stability by preventing pigment settling and pigment-vehicle separation. Excellent results have been obtained in silk screen inks and caulking compounds. Availability: commercial quantities. Ferro Chemical Corp.

O-1956-35 WALLKYD

A pure alkylid resin made from highly color retentive oils and supplied in odorless mineral spirits. Recommended for a complete line (from primer-sealers to semigloss enamels) of high quality odorless trade sale paints. It has excellent viscosity stability, color, sheen uniformity, and brushing characteristics. Availability: commercial quantities. Reichhold Chemicals, Inc.

OP-849-40 WALLKYD

A rosin-modified alkylid resin recommended for odorless flat paints providing good performance at lowest cost, and for a base vehicle for flat paints utilizing tube color tinting systems. It assures unusually good color and sheen uniformity and imparts good brushing characteristics. Availability: quantities. Reichhold Chemicals, Inc.

9120 WALLPOL

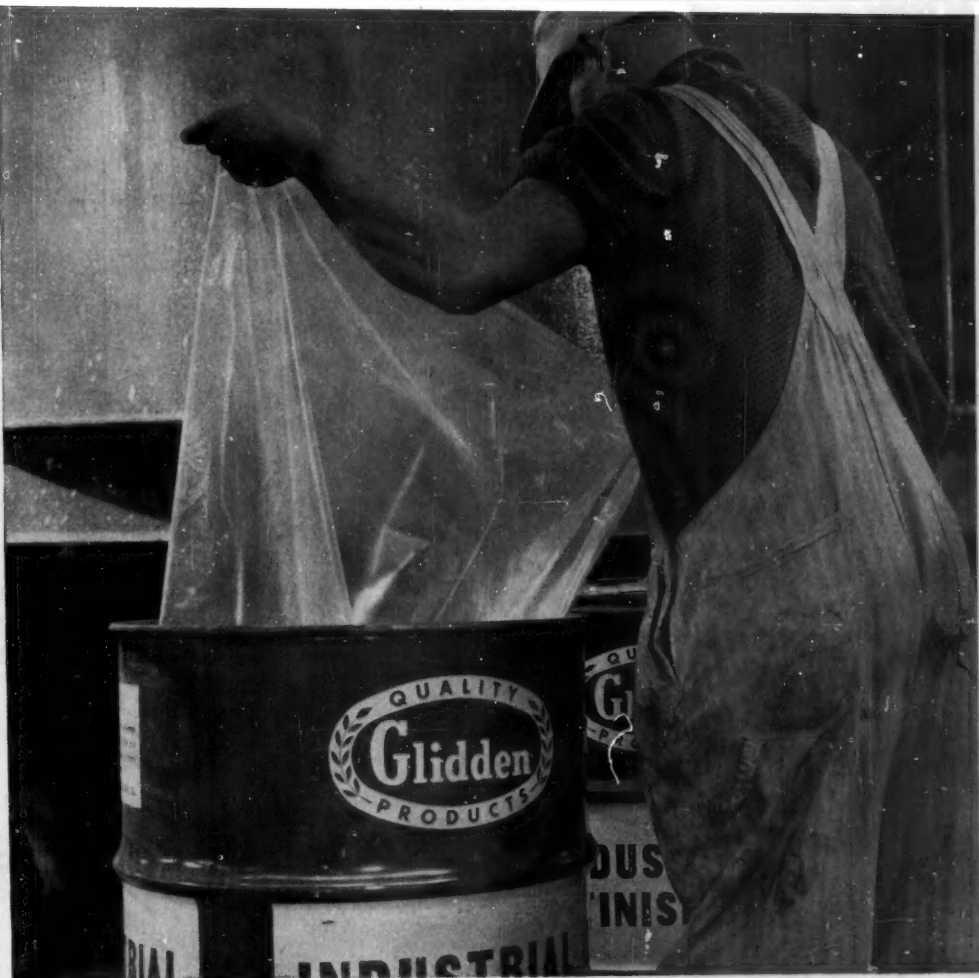
A copolymer latex developed specifically for surface-coating formulations requiring the following: high pigment biding, excellent water resistance, low-temperature coalescence, permanence of flexibility, good thermal stability with excellent film integrity and durability. Availability: commercial quantities. Reichhold Chemicals, Inc.

WB-2 WAX

A chemically modified microcrystalline wax; color, brown; M.P. (ASTM D127-49) 180 F min.; penetration 100/5 at 77 F (ASTM D1321-54T), 3-5; acid number 23-30; saponification number

"With previous forms of linings, we had to carefully screen every one for pin-holes, tears or streaks in the lining, before delivery. Men could often be tied up for hours in inspection. By using polyethylene film bags for liners, we eliminate this inspection operation." Liners are supplied by **M. J. Earle Suppliers**, Reading, Pa., and **Greene Manufacturing Company**, Philadelphia, Pa.

*"the tough
polyethylene
drum liner*



prevents acids from attacking the iron"



Drum liners made of **BAKELITE** Brand Polyethylene "have solved the hitherto serious problem of maintaining the viscosity of paint and latices during shipping and storage."

John P. Harner, Glidden Company, Reading, Pa., further reports: "The polyethylene film liner is durable, chemical resistant, water resistant, easy to work with, requires no attention or pre-shipping inspection, maintains the complete viscosity of our paints, has an excellent storage stability, is tough and flexible, protects paints from being contaminated by rusting of the containers, and, above all, assures us of a safe delivery."

"A paint's viscosity affects its uniformity of color, application characteristics, consistency and drying properties. Any deviation from the norm becomes a serious and expensive problem. However, we have found that material stored in this polyethylene lining for an indefinite period is as stable as the day it was put in."

Film and other packaging made of **BAKELITE** Polyethylene may well offer you outstanding cost savings for shipping or storing chemicals. See your packaging supplier or write Dept. UO-34.

*It pays to package
in materials made with*



BAKELITE COMPANY, A Division of Union Carbide and Carbon Corporation **UCC** 30 East 42nd Street, New York 17, N. Y.

The term **BAKELITE** and the Trefoil Symbol are registered trade-marks of UCC.

detergent formulations ... improved with Kreelon

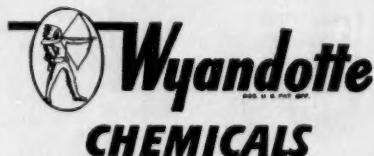


¶ Here's a product that's meant to do not one detergent job . . . but several! It's Wyandotte KREELON*—a synthetic detergent of the alkylarylsulfonate type, noted for its excellent detergent, wetting, penetrating, spreading, emulsifying, and dispersing properties.

¶ Effective under alkaline, acid, or neutral conditions . . . and in hard or soft water . . . it is used in the formulation of all types of cleaning compounds for: general cleaning, dishwashing, household cleaning, building maintenance, scouring powders, shampoos. And KREELON finds wide use, too, in treating paper and textiles, and in formulating agricultural insecticides. ¶ There are a wide variety of KREELON grades in flake or powder form, with active agents of 40% to 85% . . . as well as a special grade, KREELON CD . . . a fast-dissolving product which produces soft, long-lasting suds, combines the advantages of a detergent and a promoter (sodium CMC). ¶ If you'd like to find out more about the KREELONS, write us for complete data.

Wyandotte Chemicals Corporation, Dept. CW, Wyandotte, Michigan. Offices in principal cities.

*REG. U.S. PAT. OFF.



SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA • CHLORINE • MURIATIC ACID
CALCIUM CARBONATE • CALCIUM CHLORIDE • GLYCOLS • CHLORINATED SOLVENTS
SYNTHETIC DETERGENTS • OTHER ORGANIC AND INORGANIC CHEMICALS

C W Report

70-85. Developed for use as ingredient in carbon paper inks. Inks formulated from this wax have good flow and oil retention properties. WB-2 wax is a good solvent agent for dyes and is an effective dispersing agent for the pigment. Availability: commercial quantities. Bareco Wax Co.

WITCO 31

A refined grade of polyglycol oleate. It is used as a general nonionic emulsifier especially for fats, oils, some waxes and similar materials to produce oil-in-water type emulsions. It will not thicken upon aging and flows freely at normal temperatures. It disperses in water and is soluble in many organic solvents. Availability: commercial quantities. Witco Chemical Co.

WITCO 77-86

A liquid coupler for the production of urethane foams. Producing foams of low density, uniform cell structure, it has the added advantage of a low odor level. It will not affect the color of the final foam. Availability: commercial quantities. Witco Chemical Co.

WITCO 912 EMULSIFIER

A combination of nonionic and anionic surface-active agents developed for emulsion-type paints. It is effectively used in latex-based paints of straight butadiene-styrene, PVA and acrylic types as well as those modified with alkyds. When methyl cellulose is used as the protective colloid in latex systems, it enables thorough and even incorporation of the methyl cellulose. It will yield a smoother and constant viscosity paint, since it will not thin the paint formula. Other characteristics: ease of emulsification, nonfoaming, excellent pigment dispersion, and increased freeze-thaw stability. Final dry films made with Witco 912 have excellent scrub resistance (washability). Availability: commercial quantities. Witco Chemical Co.

WITCO FOMREZ NO. 50

A polyester for the production of flexible urethane foams. It has a narrow hydroxyl number and viscosity range and a uniformly low moisture content. Urethane foams produced are uniform, fine-celled, low in density, flexible and soft. The foams show a low compression set and a minimum of deterioration when exposed to accelerated humidity aging. Availability: commercial quantities. Witco Chemical Co.

WITCO #20 SOFTENER

A blend of petroleum-based asphaltic fluxes having a viscous liquid consistency. Used as a plasticizer for natural and GR-S rubber to improve processing without effecting the rate of cure or impairing the ultimate physical properties of the final product. The stock has a Mooney Scorch time that is 25% longer than the same recipe using pine tar—and it has the added advantage of being considerably lower in price than pine tar. When incorporated into recipe for rubber tread stock it shows properties especially desirable in larger truck tires. It can also be effectively used in tire treads and carcasses, footwear, weather stripping and other molded and extruded mechanical goods. Availability: commercial quantities. Witco Chemical Co.

XANTHINE-8-C¹⁴

Specifically labeled in the carbon-8 position. Suggested uses: in biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

XANTHOSINE-8-C¹⁴

Specifically labeled in the carbon-8 position. Suggested uses: in biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

XANTHYLIC ACID-8-C¹⁴

Mixed isomers, xanthosine 2'-phosphate and xanthosine 3'-phosphate, specifically labeled in the carbon-8 position. Suggested uses: in biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

YTTERBIUM OXIDE

Yb_2O_3 ; M.W. 394.08; insoluble in water; soluble in strong mineral acids; color, white. One of the rare earth oxides. Availability: in 99 and 99.9% purities in pilot-plant quantities. Lindsay Chemical Co.

YTTRIUM OXIDE

Y_2O_3 ; M.W. 225.94; insoluble in water, soluble in acids; color white. Availability: in 99 and 99.9% purities, semicommercial scale. Lindsay Chemical Co.

ZINC STEARATE DLG-10

A dispersible grade of zinc stearate that eliminates the need of slow, costly grinding procedures. Excellent dispersions in solvents, resins, and lacquers can be obtained by simple mixing operations. The product is especially useful in lacquer sanding sealers, where its properties provide greater clarity of films, and excellent sanding properties. Availability: commercial quantities. Nuodex Products Co.

ZINCON

$\text{C}_{20}\text{H}_{12}\text{O}_2\text{N}_4\text{S}$; F.W. 440.446. Available in the reagent grade and with a color sensitivity control. Has received attention in analytical tests for spectrophotometric determination of trace zinc. More recently this reagent has been reported to be valuable as a chelatometric indicator especially for zinc. Availability: commercial quantities as a laboratory reagent. J. T. Baker Chemical Co.

ZIRCOTAN S

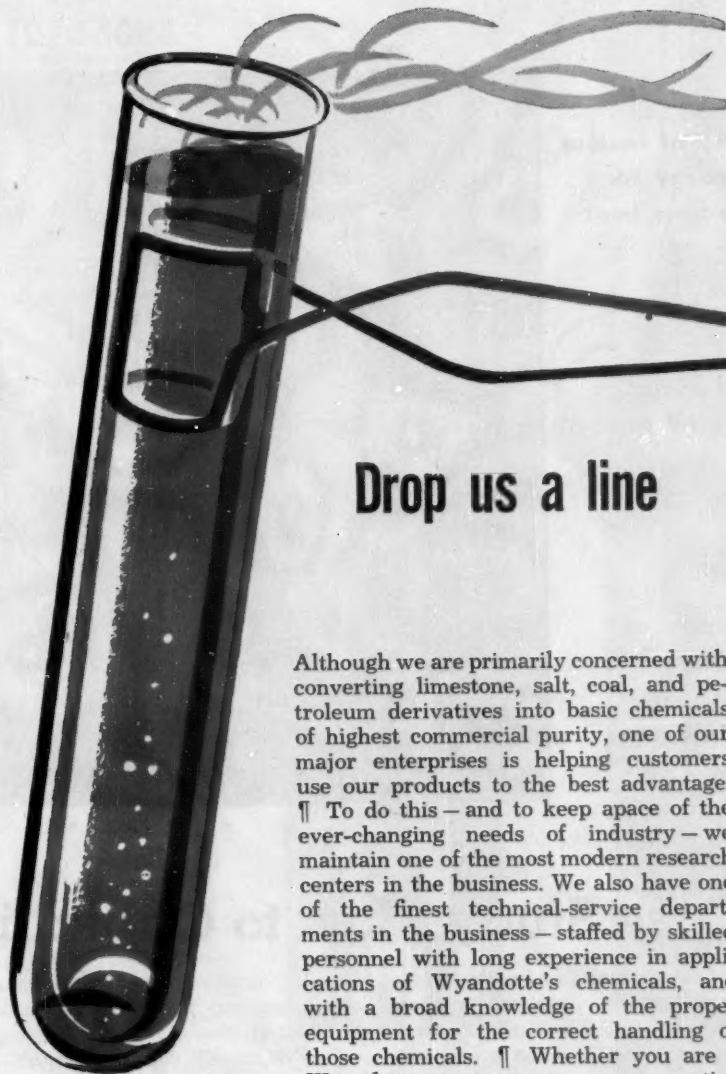
Sodium zirconium silicate tanning material. An insoluble zirconium compound that in the presence of sulfuric acid and neutral salts, effects tanning of hides and skins producing a true white leather. Availability: commercial quantities. Rohm & Haas Co.

REPRINTS AVAILABLE

Copies of this report are available from Chemical Week, Reprint Dept., 330 W. 42nd St., New York 36, N. Y., at \$1 each.

Prices for bulk quantities (over 10 copies) and for previous CW Reports are available upon request.

Need technical help?

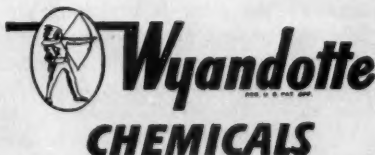


Drop us a line

Although we are primarily concerned with converting limestone, salt, coal, and petroleum derivatives into basic chemicals of highest commercial purity, one of our major enterprises is helping customers use our products to the best advantage.

¶ To do this—and to keep apace of the ever-changing needs of industry—we maintain one of the most modern research centers in the business. We also have one of the finest technical-service departments in the business—staffed by skilled personnel with long experience in applications of Wyandotte's chemicals, and with a broad knowledge of the proper equipment for the correct handling of those chemicals. ¶ Whether you are a Wyandotte customer, or a prospective customer, our complete facilities are at your disposal. If you have a product or processing problem, send us as many details as possible. We'll be happy to

lend assistance in every way we can. Wyandotte Chemicals Corporation, Technical Inquiry Section, Wyandotte, Mich. Offices in principal cities.



HEADQUARTERS FOR ALKALIES

PRODUCTION

STEEL IS CATCHING ON TO CHEMICAL ENGINEERING

Use of nuclear energy for process heat

Direct reduction of ore by chemical processing

Recovery of sulfuric acid from waste pickle liquor



Chemical operations to purify process streams

More use of oxygen, other industrial gases

Manufacture of synthesis gas

Recovery of chemicals from coke-oven gas

Case Study: How to Capitalize on a Trend

Metal companies are learning chemistry. Chemical firms are learning metallurgy. And Blaw-Knox Chemical Plants Division is off on a new and rewarding career as teacher to both.

Since Blaw-Knox established its Chemical Plants organization 16 years ago, this engineering construction unit has steadfastly avoided narrow specialization in favor of flexibility. It has, of course, done a considerable amount of work in specific fields—for example, nuclear energy, resins, vegetable oil processing. But, for the most part, it has kept its base as broad as possible.

Edson Forker, as original head and now consultant of the division, set this policy. He and his associates feel they have spotted a significant trend: the line that has always

separated metallurgy from chemistry is becoming very fine. They're doing their best to erase it.

They've already done quite a bit toward that end. For instance, at Niles, O., on the property of Republic Steel, seven steel companies are teaming up with Blaw-Knox to put a demonstration plant through its paces. Just starting operations, the plant is exploiting the Ruthner process for recovering sulfuric acid from waste pickle liquor (*CW Technology Newsletter*, Dec. 17, '55).

The idea is almost as old as steel itself. It isn't being done commercially in this country because of economic—rather than technological—reasons. But the disposal problem with pickle liquor is mounting. And the company feels that its Ruthner process may

prove a profitable venture in addition to being a way out of a knotty pollution problem.

Oxygen and Steel: As Blaw-Knox sees it, one of the most important developments in the steel industry right now is the increasing acceptance of the oxygen lance process, which has an edge over the conventional steelmaking process from some economic standpoints. Oxygen lance plants require high-purity (99.5%) oxygen. And that's where Blaw-Knox comes in.

It has, for example, built a \$2-million oxygen plant for Mc Louth Steel. Rated at 160 tons/day, the plant is the biggest ever to turn out 99.5% oxygen, although several larger ones are making 95% oxygen.

The growing use of oxygen in

YOU, too, CAN BE SURE

petrochem-isoflow furnaces

are most economically desirable

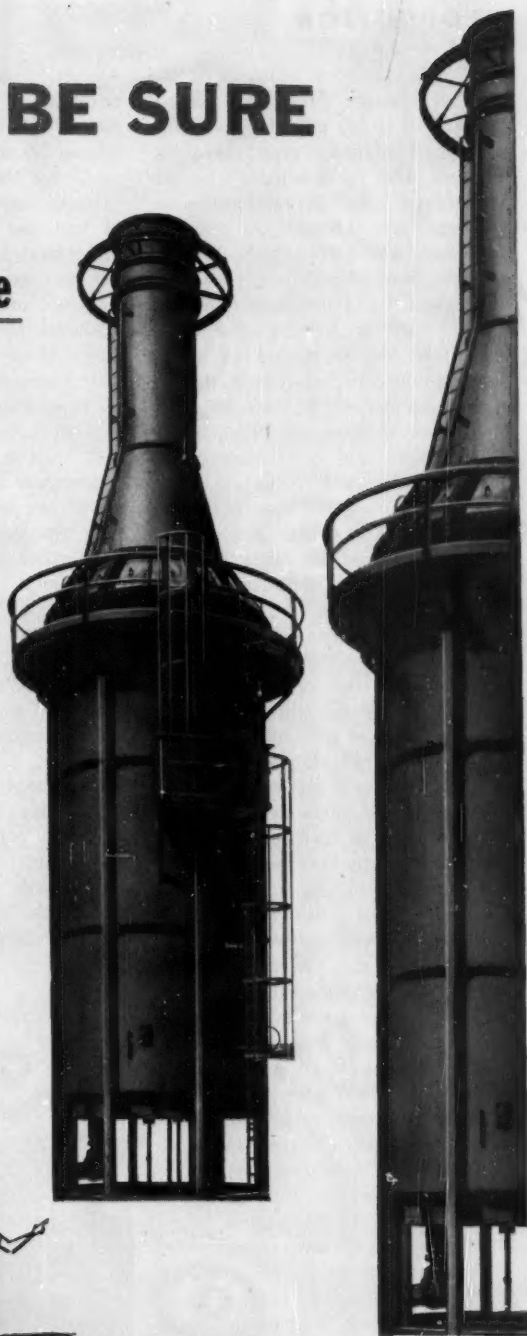
by any comparison

Whenever *all* the specifications and *all* the operating requirements are applied to direct-fired furnace design, you can be sure PETROCHEM-ISOFLOW FURNACES will be found most economically desirable, by any comparison.

In making comparisons it is essential to take these factors into consideration:

- 1—Average radiant transfer rate.
- 2—Maximum deviation from average radiant transfer rate.
- 3—Average and maximum transfer rate in convection section.
- 4—Maximum tube wall temperature, radiant or convection.
- 5—Maximum efficiency with specified excess air.
- 6—Controlled thermal recirculation of flue gases to provide even heat distribution throughout full length of each tube and equalized heat distribution around each tube.
- 7—Overload and corresponding transfer load.
- 8—Design to provide: structural column supports—Ladders—Platforms—Tube Removal facilities, etc.
- 9—Degree of assembly; of the furnace structure and of the heating surface.

When you specify PETROCHEM-ISOFLOW FURNACES ... you'll be in good company. More than 1500 are now in service, performing to the complete satisfaction of their operators and usually well beyond their rated capacities.

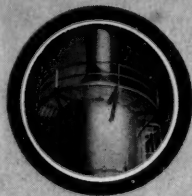


PETROCHEM-ISOFLOW FURNACES

UNLIMITED IN SIZE ... CAPACITY ... DUTY

PETRO-CHEM DEVELOPMENT CO., INC. • 122 EAST 42nd St., New York 17, N. Y.
REPRESENTATIVES:

Rawson & Co., Houston • Wm. H. Mason Co., Tulsa • Lester Oberholtz, Los Angeles • Faville-Levally, Chicago • D. D. Foster, Pittsburgh • Turbex, Philadelphia • Flogg, Brackett & Durgin, Boston • G. M. Wallace & Co., Denver & Salt Lake City
International Licensees and Representatives: SETEA-S.A. Comercial, Industrial, y de Estudios Tecnicos, Buenos Aires, Argentine • Industrial Proveedor, Caracas, Venezuela • Societe Anonyme Huerley, Paris, France • Societe Anonyme Belge, Liege, Belgium • Huerley Italiana S.P.A., Milan, Italy • Birwelco Ltd., Birmingham, England



steel offers another example of the type of thinking going on at Blaw-Knox. For it will give the steel firms a large quantity of argon as a by-product. And where is there a big potential for argon? "Titanium processing is one," says Leonard Alberts, the consultant who helped establish Blaw-Knox's low-temperature processing and synthetic fuels department in 1949. "And what better product could you pick to demonstrate the overlapping interests of chemical and metals companies?" he queries.

Former director of Ruhrchemie in Germany and a recognized authority in his field, Alberts believes that this type of operation is leading to a situation in which any distinction which might be made between metal and chemical industries will be virtually meaningless.

"Steel companies are sooner or later going to switch to oxygen in their blast furnace operations, too," he says. "And that will give us another opportunity to supply steel mills with tonnage oxygen plants.

"Possibly more important, it can give the steel companies a beautiful synthesis gas as a by-product. For that reason, steelmakers as well as the petroleum industry are the future candidates to make synthetic fuels." (However, Alberts believes that synthetic pipeline gas, perhaps made by gasifying noncoking coal, will be a reality before anyone starts making synthetic fuel on a large scale.)

More Chemicals from Coke: Although coke ovens have always been an important source of organic chemicals, Blaw-Knox Chemical Plants is betting they'll become even more important in the near future.

Right now, it's building a plant for U.S. Steel to recover hydrogen—as a starting point for ammonia (*CW*, Dec. 4, '54, p. 50)—from coke-oven gas. Costs of making ammonia this way, Blaw-Knox estimates, are 10-15% lower than those obtainable from other known sources.

To recover the hydrogen, moreover, propylene and higher hydrocarbons, then ethylene and finally methane must be taken out. The amount of propylene that could be recovered from such an operation is probably not significant. But the amount of ethylene is.

"When you start talking about a 200-tons/day ammonia plant," says

Alberts, "you're talking about the possibility of recovering 20-30 million lbs. of ethylene a year. And you're talking about ethylene that can be made for roughly 2¢/lb.

"You still have a whale of a lot of methane that could be used to make more hydrogen, sold as natural gas, and used to make acetylene or methanol and its derivatives."

Recent moves by coke manufacturers shore up the feeling around Blaw-Knox that there's lots of room for more chemical engineering on the part of coke operators. U.S. Steel and Jones & Laughlin are going to hydrogenate their light-oil streams so they'll produce aromatics that can meet specifications of petroleum-derived material (*CW*, Sept. 8, p. 155). Although it is not engineering either installation, Blaw-Knox has a hydrogenation process ready for the task. Also, it is ready to do the job using coke-oven gas instead of pure hydrogen, thus making the venture more attractive for smaller-scale operations.

It is convinced, too, that there's a place in the coke-oven industry for its wet contact process for making sulfuric acid from hydrogen sulfide. A variation of the regular contact process, the method does not require dry sulfur dioxide for catalytic conver-

sion into trioxide. It's applicable to very dilute gases; and on a coke-oven gas stream, it could be used to produce an acid ideal for making ammonium sulfate from the ammonia present in the gas.

Works Both Ways: More attention to chemical technology by metal firms is foreseen in areas other than by-product processing. Blaw-Knox feels they'll also lean more heavily on chemical techniques for turning out metal products. Here are some of the developments upon which it hopes to capitalize:

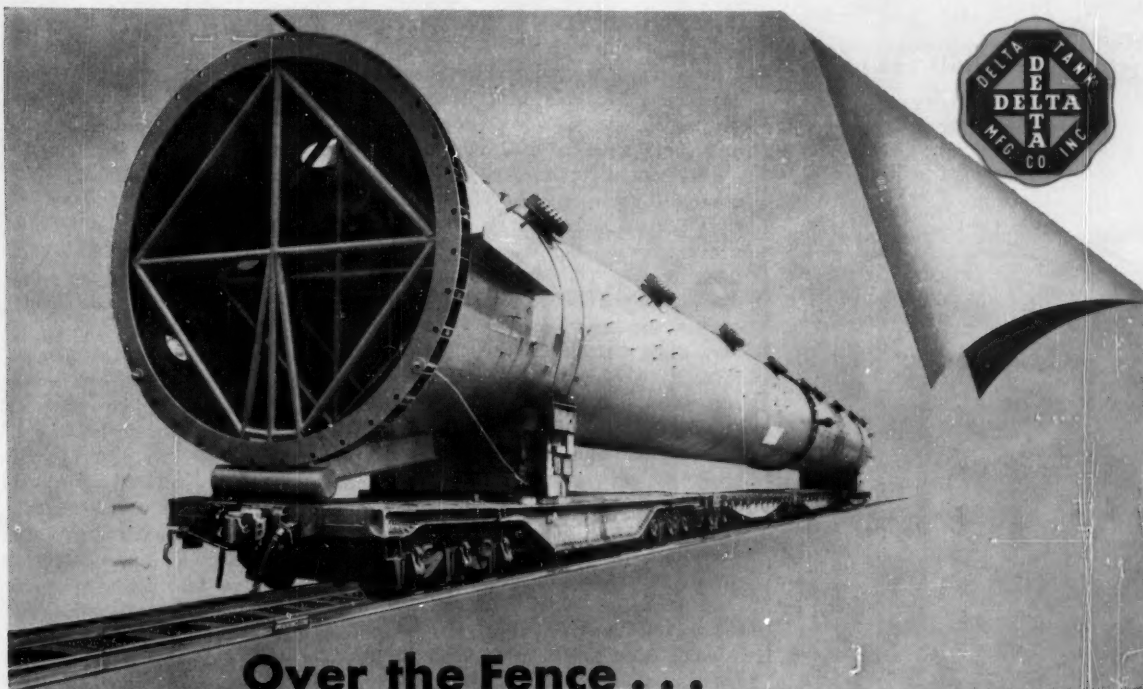
- **Direct reduction of iron ores.** Several steel companies are developing processes to make iron directly from the ore by reducing with hydrogen in fluidized beds or other methods (*CW Technology Newsletter*, March 31). If these efforts prove out, tremendous amounts of hydrogen will be needed—and Blaw-Knox is prepared to build needed facilities.

- **Nuclear energy.** There's been talk by steel companies—and aluminum makers, too—of using nuclear energy as a source of process heat. Blaw-Knox feels its background in the atomic energy field would fit in nicely for such a project.

- **Wet metallurgy.** New ore-leaching methods that require high temperatures and high pressures mean

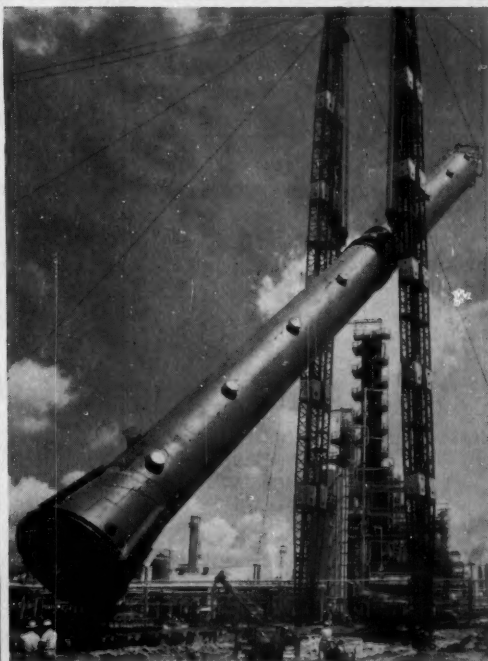
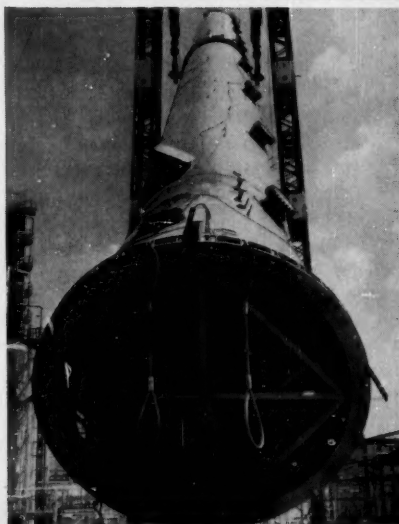


BLAW-KNOX'S FORKER: Erasing the line between chemistry and metallurgy.



Over the Fence . . .

It was a short railroad trip for this giant Deisobutanizer Tower after fabrication in Delta's Baton Rouge plant. The tower was built for Esso Standard Oil, whose Baton Rouge refinery's south fence is the Delta plant's north fence. Four rail cars were necessary to move the giant into place for erection by Esso's own forces. Its gross weight is 410,000 pounds, with an overall length of 207 feet, two inches—more than a ton per foot. It was fabricated complete for shipment in one piece—The Biggest Yet!



DELTA TANK MANUFACTURING CO., INC.

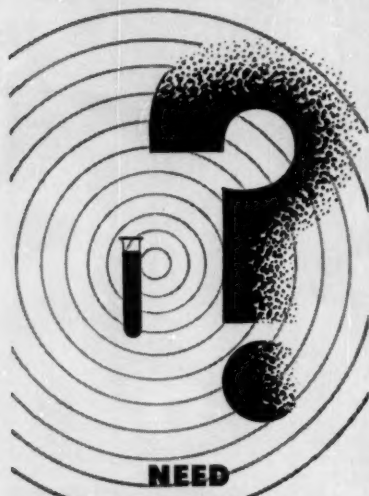
BATON ROUGE, LOUISIANA

PLANTS: BATON ROUGE, LA. • MACON, GA. • BEARDSTOWN, ILL.
EXPORT OFFICE: INTERNATIONAL TRADE MART, NEW ORLEANS, LA.
SALES OFFICES: NEW YORK, N. Y. • WESTWEGO, LA. • LAFAYETTE, LA.
BOSSIER CITY, LA. • HOUSTON, TEXAS • WHITTIER, CALIFORNIA



Over a half century...

SERVING INDUSTRY
THROUGH CHEMISTRY



NEED A POWERFUL REDUCING AGENT

Investigate Jacques Wolf's Line of Hydrosulfites

If your process requires a reducing agent it will be to your advantage to investigate the complete line of Jacques Wolf Hydrosulfites and Sulfoxylates. High in strength and purity, they are available in different physical forms to meet your specific requirements.

As reducing agents Jacques Wolf Hydrosulfites find wide application in textile processing as well as in the manufacture of pharmaceuticals and chemical compounds. In the food processing industry Hydrosulfites are widely used as a bleaching agent. As a catalyst, our Hydrozin is employed for polymerization of Vinylmonomers.

Possibly you can hasten, improve or reduce costs of your present process or product through the use of Jacques Wolf Hydrosulfites. Complete data and samples will be sent you upon request.

JACQUES WOLF & CO.
Chemicals PASSAIC, N.J.

Plants in: Clifton, N.J., Carlstadt, N.J., Los Angeles, Calif.



PRODUCTION

that purity is becoming increasingly important. That, in turn, means a greater reliance on solvent extraction and other chemical unit operations.

Off-Shoot of Rubber: The Chemical Plants Division is an offshoot of Blaw-Knox's experiment in the '30s with rubber—a line of activity dictated by the company's equipment interests. When the government started its synthetic rubber program, Blaw-Knox established the division to carry its own work through. Subsequently, it designed and built the prototype GR-S unit.

Since that time, the division has grown to an organization that does a volume of business ranging from \$25 million to \$50 million. Next year, it expects to hit about \$40 million. It hires 675 people, about three-fourths of whom are engineers and technical people. About 70% of its work is on a fixed-price basis; the rest is being done for cost plus a fee.

Throughout its entire history, the division has emphasized flexibility in its work. It has, in fact, established a Special Plants Dept. so it can handle small jobs that can't bear the overhead of a big organization. It takes pride in the fact that although it has shunned specialization, 60-80% of its business comes from firms it has previously worked for.

"It is a policy that has given us steady growth rather than spectacular surges," says Charles Hauck, vice-president in charge of sales. "We don't intend to change it. But we do think we see a marriage of chemistry and metallurgy in the offing. Frankly, we'd like to officiate at the ceremony."

Standards Branch Out

One of the top orders of business at the Ninth National Chemical Exposition in Cleveland last fortnight was a progress report on standardization of chemical process equipment. Standards committee leaders reported that centrifugal pump standards will be out in tentative form by next spring.

Two other important classes of equipment—heat exchangers and tanks—are already the subject of preliminary planning. Significance: standardization of tanks and exchangers could save the industry \$6-7 million/year.

American Standards Assn.'s J. R.

Boyer stated that tentative recommendations for centrifugal pumps will be based mainly on over-all and mountings dimensions. The committee's most difficult task, he said, was to decide what essential features of chemical pumps should be covered by standards. But now that these basic decisions have been made, the group expects to complete its recommendations by the end of '57.

Tanks in Transition: The greatest room for improvement in tank standardization, according to Merck's Peter Jandrisevits, lies in the area of units designed for less than 15 psig. that are not now covered by ASME or other construction codes. To narrow this general range still further, the tank-standards group is developing a tentative scope to include low-pressure, 100-30,000-gal. tanks with maximum dimensions that permit shop-fabricated units to be shipped by common carrier.

Cost of tanks in this class, the committee estimates, is 4% of the chemical process industry's \$800-million annual capital outlay. A 10% saving that might be effected by minimum basic standards would amount to about \$3 million/year.

A similar saving of \$3-4 million could be realized, predicted Procter & Gamble's A. H. Knoll, from good minimum standards for heat exchangers. To supplement existing standards developed by the Tubular Exchanger Manufacturers Assn., a Manufacturing Chemists' Assn. subcommittee has been surveying the field, with special emphasis on the five most common types of shell and tube exchangers designed for pressures to 600 psi.

The investigating group believes that the most fruitful areas for exchanger standardization would cover: minimum construction features for the full range of sizes normally used; certain critical dimensions and nomenclature; a completely standardized series of units in sizes to 1,200 sq. ft.

It also sees a possible need for two sets of specifications: for critical service units where quality requirements are high, and for less critical service where maximum economy of construction is the controlling factor.

Knoll sees these interim ideas as the most likely framework for the subcommittee's final recommendations due early next year.

Technology

Newsletter

CHEMICAL WEEK
December 15, 1956

Look for word soon about a new company in the low-pressure polyethylene field. One of the larger chemical firms, it has not—until now—been associated with polyethylene; nevertheless, it has quietly been developing its own process.

Ethyl Corp. reports a new tetraethyl lead process called “radically different from any hitherto used or proposed.”

The firm is not prepared to say much about the process other than that it involves the reaction of a lead compound with a metal alkyl, and that further details will be reported soon.

Ethyl previously had looked at Ziegler's process for making TEL by electrolyzing aluminum triethyl in a cell with a lead anode. The new process, it emphasizes, is not the Ziegler process.

Industrial dermatitis may be costing you more lost man-hours than you think. That's the conclusion implicit in a just-completed survey of the Assn. of American Soap and Glycerine Producers.

The survey covered 141 plants with 429,000 employees. Highlights:

Of the total number of employees, 26% were exposed to potential skin irritants every day. Of the 26%, at least 9% picked up some form of skin disease.

Fifty-nine of the companies surveyed were able to report that 18,219 man-hours were lost that way. But because of the difficulty in measuring such lost time, chances are that such figures are conservative.

The survey also revealed that three-quarters of the companies felt that an employee educational program was the best way to defeat industrial dermatitis, but only one-third actively promoted such programs. The study was undertaken by the association as part of its low-pressure sales effort boosting cleanliness (and soap).

Senate antitrust watchdogs are pushing for completion of a three-volume study of the patent situation. Chairman Joseph C. O'Mahoney (D., Wyo.) expects to have copies ready by Christmas. Authors: “Proposals for Improving the Patent System,” by Vannevar Bush; “The Patent System in the Modern Economy,” by Chicago attorney George Frost; and a statistical analysis and tabulation of patents issued to corporations by the U. S. Patent Office.

The Patent Office tabulation shows that 176 major firms obtained more than 20% of all patents issued to corporations and individuals in the 1939-55 period, with General Electric (10,757) and American

Technology Newsletter

(Continued)

Telephone & Telegraph (8,539) topping the list. Chemical process firms placing in the top 10 were Du Pont (fifth), Esso Standard Oil (sixth), Eastman Kodak (eighth) and American Cyanamid (tenth).

O'Mahoney says the three reports will be the basis of hearings that his subcommittee on patents, trademarks and copyrights "plans to resume shortly after the new Congress is convened."

•
Mallory-Sharon Titanium (Niles, O.) will spend \$500,000 on a pilot plant to test an electrolytic process for recovering titanium from scrap. The process has been developed by the firm in its own labs.

Exactly how much of the titanium sponge produced in this country ends up as scrap is something of a secret. But it's sizable. At an 83rd Congress hearing (Senate Minerals, Materials & Fuels subcommittee), testimony indicated it was 40%.

One of the tricks in developing a satisfactory scrap recovery process has been separation of the alloying material; also, contaminants (nitrogen, oxygen, etc.) accumulate. Consequently, purity may be even more of a problem than in the original processing.

•
The National Bureau of Standards is going to push research in free radicals, their properties in solid, liquid and gaseous phases, their recombination rates at different temperatures and their reactions with other materials. Bureau scientists have already done considerable work in storing and analyzing free radicals. Its new program will be sponsored by the Army's Office of Ordnance Research, will draw largely from other institutions for participating scientists.

•
Cowles Chemical (Cleveland) is now producing niacin, using a new process developed by its own researchers. It says that the process involves a catalytic air oxidation.

•
A new photo-sensitive plastic that will print photographs in a brightly lighted room, an ordinary kitchen oven or in a radiation-exposed military area has been developed by the Army Signal Corps engineering labs (Ft. Monmouth). Based on a discovery by Ferro Chemical Co. (Bedford, O.), the process utilizes an aluminum plate coated with a special vinyl. Placed under a negative, the plate is exposed to a strong ultraviolet light for five seconds to engrave an invisible image into the plastic. Baking at 320 to 350 F will bring out the picture. Five minutes later, the plastic can be stripped from the metal as a finished print—claimed to be clear, durable, waterproof, and stronger than today's paper print.

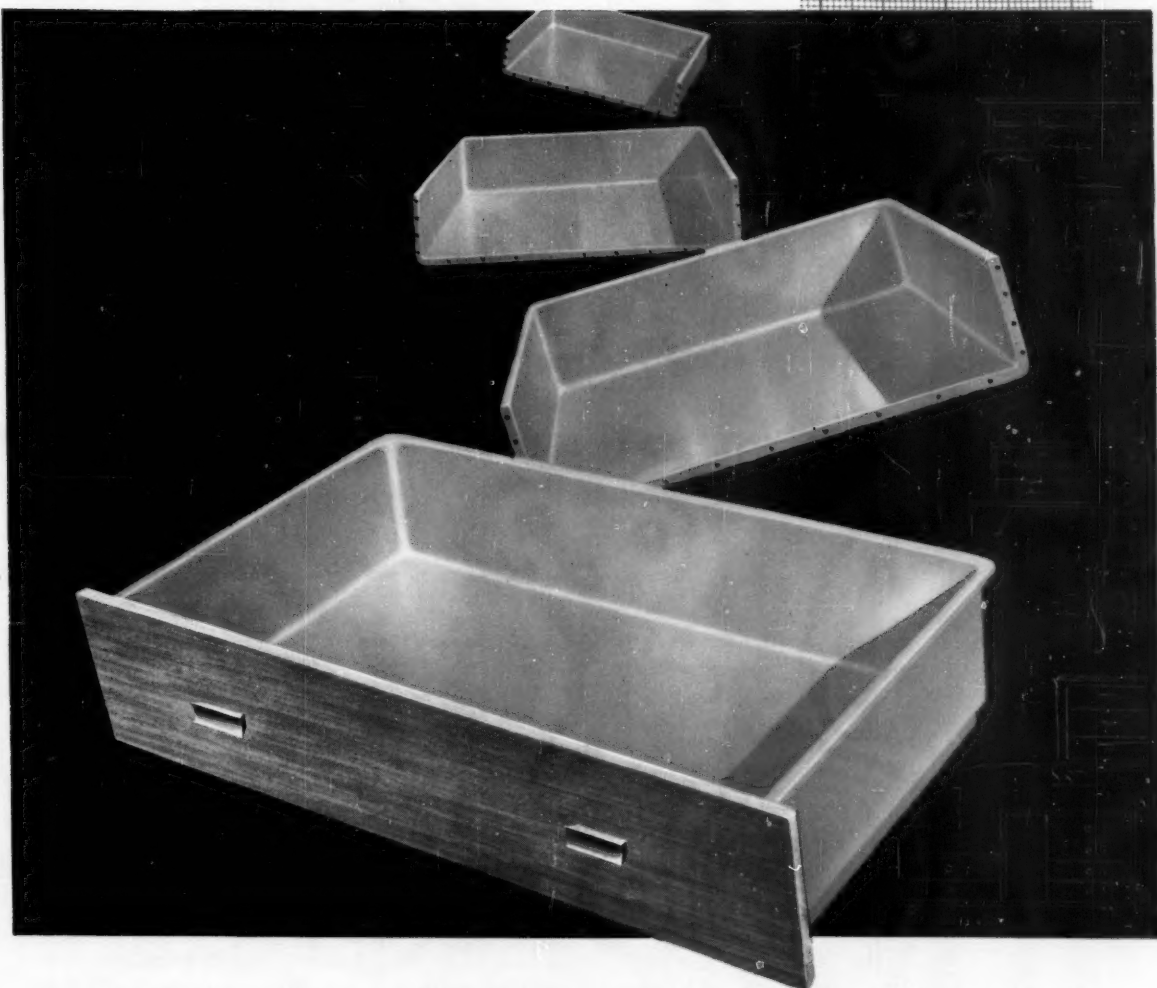
Q. Could engineering in plastics molding make a significant contribution to the furniture field?

A. **DRAWERS THAT COMBINE THE ADVANTAGES OF PLASTICS WITH THE WARMTH OF WOOD**

Another example of



**CHEMICAL
PROGRESS**



You've often dreamed of a drawer like this! A drawer that won't warp or stick . . . that's free from dust-collecting joints . . . that's light yet sturdy. Now it's a reality—with *molded plastics* drawers—developed, engineered and molded by General Electric's Plastics Department.

Molded plastics drawers are moisture-proof, non-warping. Their seamless, jointless, round-cornered construction makes them far easier to clean. Molded in a variety of sizes and colors, they are produced as complete units, ready for the addition of facings to match wood grains or plain finishes, traditional or modern styles of furniture.

These drawers are opening up new markets for plastics—in the furniture field . . . the home construction field . . . cabinet making . . . and the do-it-yourself fan who finds them ideal for creating arrangements of his own design.

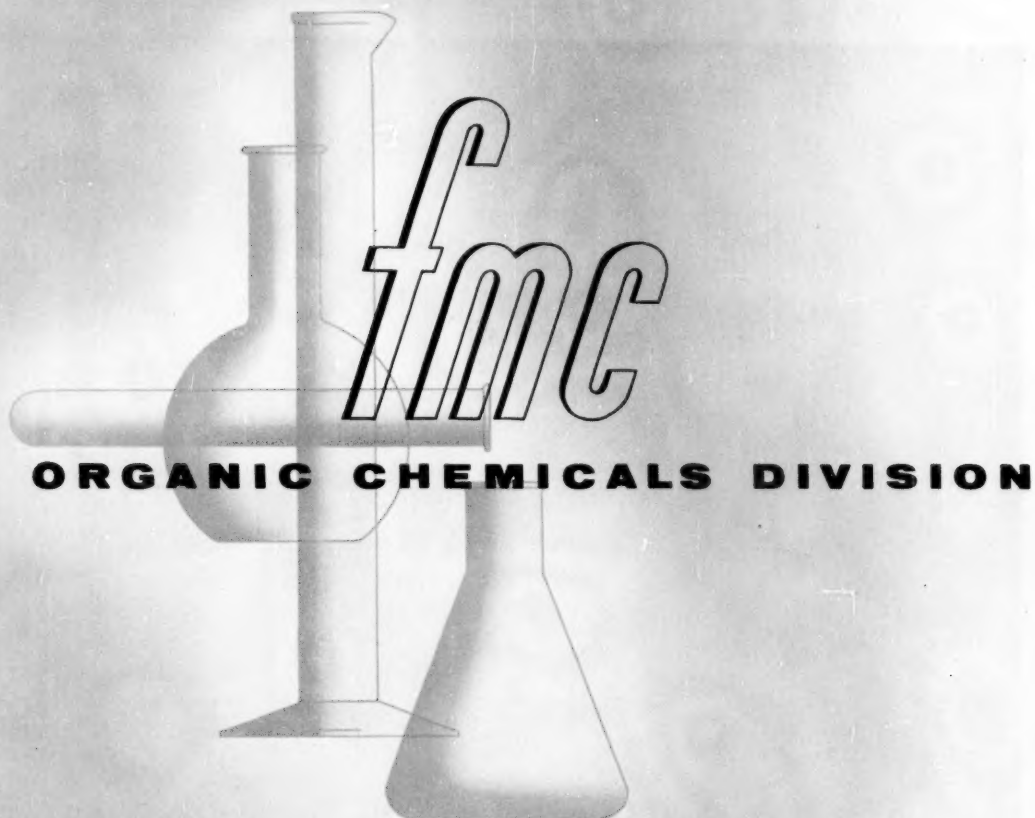
* * *

For more information on plastics drawers by General Electric, write to Dept. PL, CHEMICAL AND METALLURGICAL DIVISION, General Electric Company, Decatur, Ill.

Progress Is Our Most Important Product

GENERAL  ELECTRIC

*a creative new force
in your future...*



We are pleased to introduce a new member of FMC Chemical Divisions! Devoted to research, production and marketing of organic chemicals and polymers, it is certain to be a constructive new factor in the chemical industry.

FMC Organic Chemicals Division will be fully integrated on many basic raw materials within the FMC group. It will benefit from FMC's many years of experience in chemical process development and production. Research will be augmented by the FMC Central Research Laboratory at Princeton, where important developments are already in progress.

Our formal entry into the field of organic chemistry on a broad front will greatly strengthen our overall ability to serve industry and agriculture.

fmc

FOOD MACHINERY AND CHEMICAL CORPORATION

chemicals

Chemical Divisions Administrative Offices • 161 E. 42nd St., New York 17

BECCO peroxygen chemicals • FAIRFIELD pesticide compounds • FMC organic chemicals • NIAGARA insecticides, fungicides and industrial sulphur
OHIO-APEX plasticizers and resins • WESTVACO alkalis, chlorinated chemicals, carbon disulfide, phosphates, barium and magnesium chemicals

MARKETS

U.S. ALUMINUM CAPACITY:

(million pounds)

In four years, an estimated 44% increase

Producer	1956	1958	1960
Aluminum Co. of America	1,585	1,925	1,925
Anaconda Aluminum	120	120	120
Harvey Aluminum	—	134	134
Kaiser Aluminum & Chemical	869	1,174	1,364
Olin Revere Metals	—	60	360
Reynolds Aluminum	920	1,120	1,150
Totals	3,494	4,533	5,053

More than Enough—for Now

U.S. aluminum production, high-balling along at a frantic rate in an effort to catch up with consistently outpacing demand, will this year (for the fifth consecutive year) topple all previous output records. But perhaps more significant is this: total aluminum supply—from an exploding domestic productive capacity (see table), imports and scrap recovery—will soon be great enough to satisfy all foreseeable consumer requirements.

Spotlighting the upcoming switch in the chemically derived metal's supply/demand situation is the recent statement by Alcoa's (Aluminum Co. of America) president, Irving Wilson, at the regional convention of the New York Society of Security Analysts: "Instead of being plagued by the problems of attempting to meet demand, as in the past, manufacturers should at last be able to design and use aluminum in various new applications with confidence that the supply will be adequate."

A balanced aluminum market has been a long time coming. Several rounds of government-sparked expan-

sions to fill war-spawned needs invariably fell short of completely satisfying military and civilian consumers. But expansions prior to the Korean War are Lilliputian compared with projects now being built or planned by the industry.

Already in place, for instance, are domestic facilities capable of turning out nearly 3.5 billion lbs. of primary aluminum. Match that against last year's output of some 3.1 billion lbs. (which was more than double 1950 U.S. production), and the 5 billion lbs. or more expected within the next four years, and the pattern of aluminum procreation becomes clear.

Right now, Anaconda Aluminum, the country's newest primary producer, is rounding out the first full year of operation at its new Columbia Falls, Mont., plant, which, when it was completed late last fall, wrapped up the capacity expansion program begun during Korea to meet mobilization goals. Although the plant is rated at some 120 million lbs./year, actual production here (as at most every primary producing unit in the country)

is—and has been—exceeding the designed capacity level.

Anaconda has no immediate plans for further expansions (it will gear its aluminum raw material production in the next few years to primarily captive fabricating needs), but old-line producers Alcoa, Kaiser and Reynolds are upping capacities substantially while Harvey Aluminum (a subsidiary of Harvey Machine) and Olin Revere (a joint Olin Mathieson and Revere Copper & Brass venture) (*CW*, Sept. 8, p. 39) will become new producers. (St. Joseph Lead has shelved earlier plans for an aluminum plant at Josephstown, Pa., but tells *CW* that possibility of the project being revived one day should not be ruled out.)

Reason for these expansions ties in with the current—and anticipated—bursting-at-the-seams, predominantly nonmilitary market for aluminum. Only in the last few years have direct military shipments eased off significantly, made room at the nation's aluminum trough for hard-pressed "peacetime" outlets. In '52, for instance, direct military uses siphoned



Chemical Processing Staff Photo

60,000 tons to distribute yearly; lots as small as 25 lbs.

International Salt Company chooses Michigan for rehandling job in new Chicago warehouse

This world-famous company, largest producers of salt in America, have a tremendous material-handling problem at their recently-completed, completely-modern warehouse in Chicago. Into this huge, arched, cathedral-type building 178 feet long, 162 feet wide, and 70 feet high comes 60,000 tons of salt a year. All of it—120,000,000 pounds, in 10 different types and sizes—has to be re-handled for shipment. Some lots run 50 tons or more each . . . some are as small as 25 pounds. One tractor shovel does *all* re-handling from stockpiles, feeding the salt, on order, to centrally-located weigh hoppers for bagging or bulk shipment (same unit also loads salt, at times of peak demand, directly into trucks).

Tractor Shovel is key to operation

In selecting this tractor shovel, so important to the entire operation, prime considerations were:

1. Large capacity
2. Speedy handling
3. Utmost safety and
4. Low maintenance costs.

In the opinion of International Salt Company officials, *only one machine passed ALL tests with flying colors: a Michigan Tractor Shovel!*

Chosen from 5 models

With five basic models, 44 to 165 hp, and buckets from 6 cubic feet to 5 cubic yards, to choose from, International Salt Company picked the 80 hp, 1 cubic yard,

bucket wheel drive Michigan Model 75B you see here.

This unit, like all Michigans, gives International Salt the efficiency only a matched all-Clark-designed and built power train can give. No-clutch shifting to change speeds and direction, at the flick of a lever. Power steering. Shock absorbing torque converter with 3-to-1 torque multiplication. Forward and reverse speeds to 26 mph. Adequate power and weight, plus low-level rollback and low-level-carry, to get and deliver heaping loads. Utmost safety, with big brakes and excellent all-around visibility. Planetary axles which *completely eliminate axle breakage.*

See Michigan in action

No matter what kind of bulk material *you* have to handle—fertilizer, foods, sand, or chemicals—these Michigan features are well worth checking. It's simple to do. Write or call us any time. We'll be glad to help you analyze which size Tractor Shovel best fits your needs . . . then show you that machine in action, in your plant, doing the jobs you want to see done!

Michigan is a registered trade-mark of

CLARK EQUIPMENT COMPANY

Construction Machinery Division

2459 Pipestone Road

Benton Harbor 44, Michigan



MARKETS

some 30% (793 million lbs.) of that year's shipments (2.66 billion lbs.). By last year the direct defense take had slid to only 9% of total '55 shipments, or, in pounds, to less than half (370 million) what they were in '52.

The government's stockpiling program has been a chief factor in keeping the aluminum supply/demand scale out of kilter. Since the first quarter of '55, however, the Office of Defense Mobilization has periodically called moratoriums on stockpile deliveries. These have resulted in diversion of substantial amounts of the metal to industry. This year alone, some 800 million lbs. of stockpile-headed material will be channeled to industry, bringing the total, since early '55, to about 1.3 billion lbs.

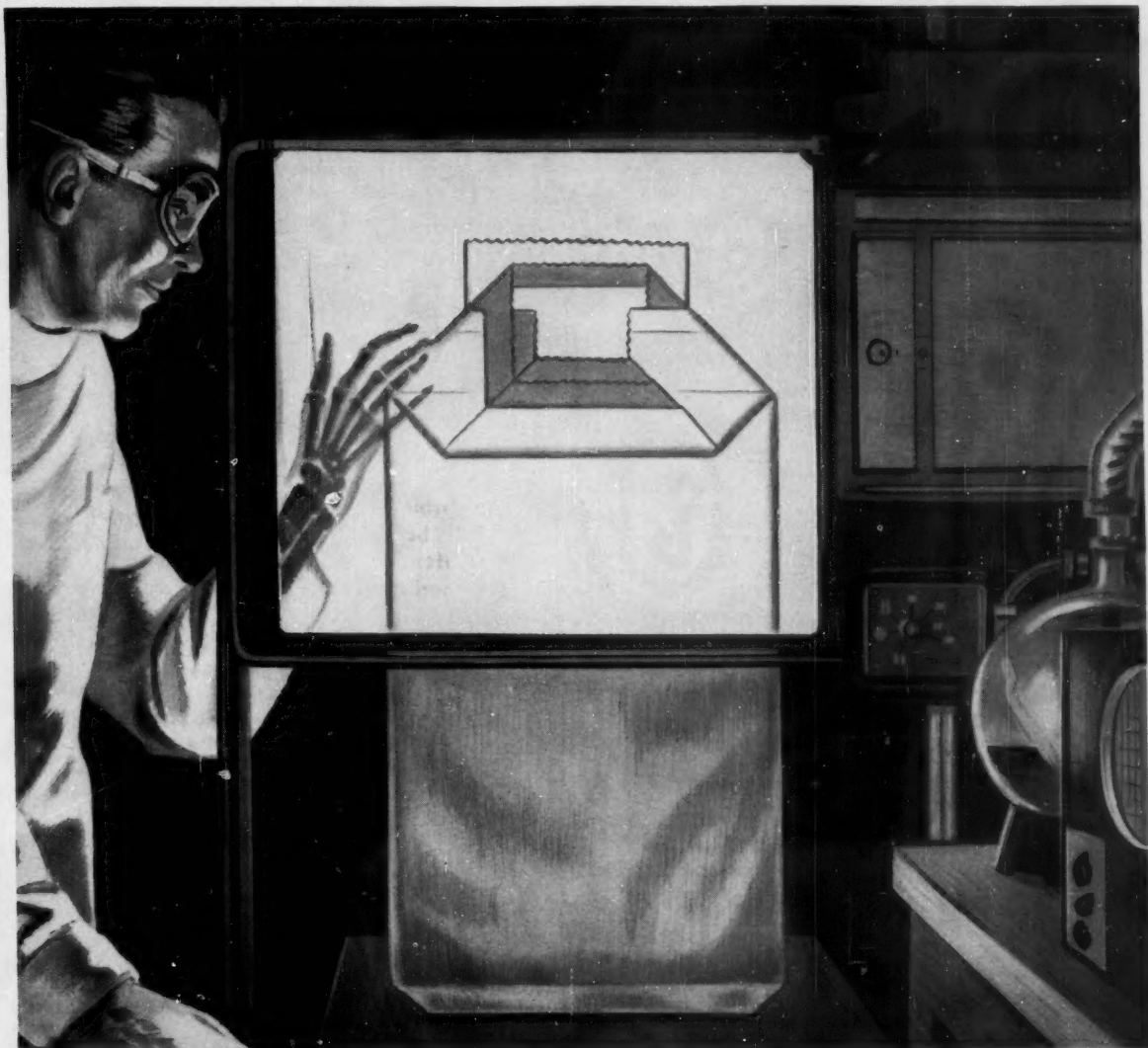
Import Bolsters: But domestic expansions and diversions aren't enough to fill all consumers' requirements this year. As in '55, the U.S. must look to imports to prop an inadequate supply. But increasing worldwide demand for aluminum has had some impact on U.S. imports, particularly from Canada, this country's prime foreign source. Last year, for example, total exports from Canada rose to nearly 1,046 million lbs. (from about 950 million in '54), but it's reported that about 92% of the increase went to Great Britain, only 1½% to U.S. markets. This year, Canadian exports to the U.S. will amount to approximately 500 million lbs. of primary aluminum ingot, and, by '58, the total will exceed 600 million.

Likely to add incentive to this trend is the fact that tariffs are progressively being reduced from 1.5¢/lb. prior to July of this year, to 1.25¢/lb. by July 1, '58.

At midyear, Canada's annual aluminum capacity amounted to slightly less than 1.5 billion lbs., but expansions in the works will up that figure to almost 2.25 billion before the end of '60. Aluminium Ltd., for one, is planning a 600-million-lbs./year increase in its present 1,464-million-lbs. capacity; British Aluminium Ltd. will enter the field with a 160-million-lbs./year installation.

Secondary Metal: Secondary metal (which includes scrap aluminum of various types) will continue to be an important part of the aluminum supply picture. This year, the total available (from domestic sources and imports) is expected to be a shade above

Things you can't see count too!



HUDSON Ply-weld

The New, **STRONGER**
Stepped End Multiwall



HUDSON PULP & PAPER CORP.

477 Madison Avenue • New York 22, N. Y.

Plants at PINE BLUFF, ARK. • PALATKA, FLA. • WELLSBURG, W. VA.

The Inside Story of this new bag is one of benefits to you. Its overlapping, pressure-welded plies give you these definite advantages:

STRONGER at valve and bottom ends. Plies overlap and weld together for extra strength at stress points.

REDUCES BREAKAGE in filling and transit. Greater strength saves time, temper, money.

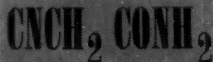
SPEEDS PRODUCTION. Goes on the spout faster, more easily.

HANDSOMER, more attractive when filled because of smoother, more flexible sides. Gives greater product appeal.

If it's protection and speed in handling you want, write for full details on this new, stronger pack. Address Dept. 311

KAY-FRIES

Cyanoacetamide



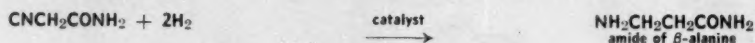
CYANOACETAMIDE (both a nitrile and an amide) is another Kay-Fries intermediate with a cyano-activated methylene group. It is now used in the syntheses of vitamins and barbiturates. Potentially its usefulness can be expanded. It has been suggested as an intermediate for special resins, substituted piperidines and pyridones, new pharmaceuticals and general organic synthesis.

KAY-FRIES SPECIFICATIONS ...

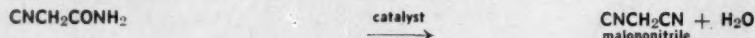
purity	• 99.0% min.
melting point	• 119.0°-122.0°C (meniscus to complete melt)
ash	• .05% max.
solubility	• 1 gm. completely soluble 9 gm. dist. H ₂ O

Typical reactions of CYANOACETAMIDE

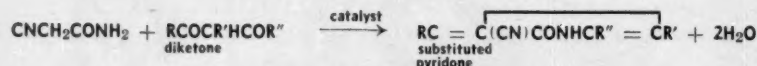
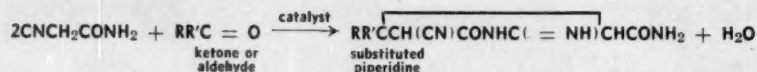
REDUCTION



DEHYDRATION



CONDENSATIONS



TECHNICAL DATA BULLETIN AVAILABLE

Write or Phone

**KAY-FRIES CHEMICALS, INC.**

180 MADISON AVE., NEW YORK 16, N. Y., MURRAY HILL 6-0661

MARKETS

'55's estimated 815 million lbs. But with aluminum production and use due to burgeon, scrap recovery, too, will shoot higher. One estimate for '58: 1.1 billion lbs.

Thus, totaling all these expanding sources (domestic production, imports, secondary metal), it's apparent that pinched consumers will have, within two years, an aluminum availability of well above 6 billion lbs.

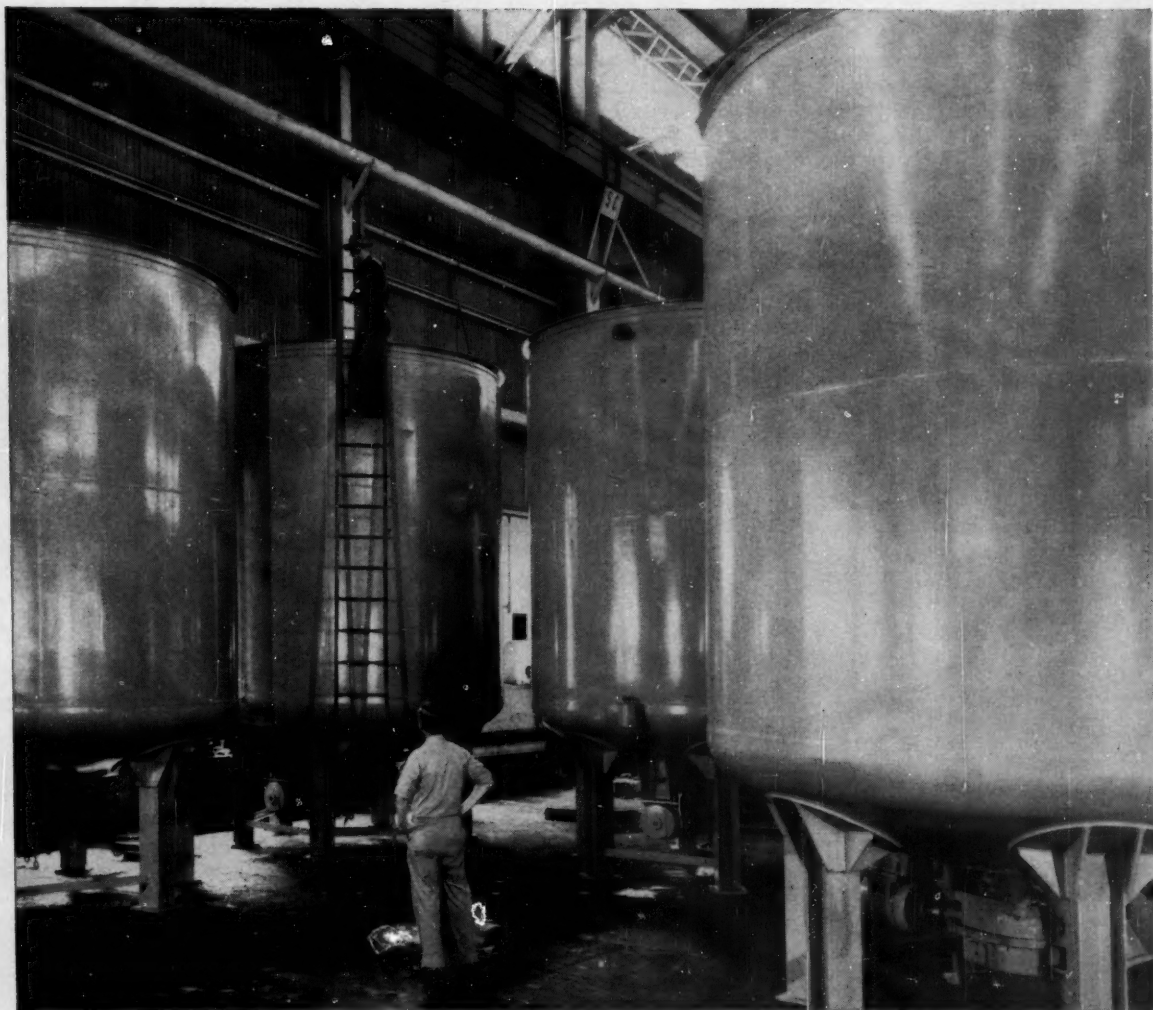
This definitely points to a period of aluminum plenty, but the prospect of oversupply doesn't faze producers. Why? Most economic forecasts strongly support a continued expansion of markets for aluminum. Some of these views estimate that by '60 aluminum markets in this country alone will be at least 50% larger than they are today.

Building products, transportation, consumer durable goods, and the electrical field have long been the major consumers of aluminum, now take, respectively, about 19%, 17.5%, 13% and about 8% of total consumption. Machinery and equipment (except electrical), paints and chemicals, packaging and containers, and miscellaneous uses, each take approximately 3-7% of the supply.

But note these projections of aluminum consumption—solid indications that another period of pinched supply within a decade is not inconceivable if further expansions aren't forthcoming. The building trade anticipates that aluminum use this year will top '55's by 15-20%; utilities, which last year consumed about 200 million lbs., are expected to require more than 1.5 billion lbs. by '60; the automobile industry, which used some 175 million lbs. in passenger cars last year, may take as much as 750 million by '65.

And there are other outlets, just now beginning to hit the "big time," that will be spurred to greater use of aluminum with greater availability. Refrigerators (last year took some 72 million lbs. of aluminum), packaging and containers are expected to increase their aluminum use 80% by '60; and even the atomic program has underscored the usefulness of aluminum in nuclear reactors and associated equipment.

Aluminum supply may well overshoot its primary target of adequately fulfilling demand, but it's clear, too, that consuming outlets are ready to raise the sights.



Dravo workmen complete inspection of four 8,000 gallon liquid batch blenders

The buyer of this process equipment didn't have to raise the roof

Ever face this problem? When new production equipment is larger than available space, something must be changed. Either you raise the roof or find a supplier to design within your limitations. In this case, four liquid batch blenders of 8,000 gallon capacity were required by a large chemical process firm. Working closely with the customer, Dravo's Process Equipment Department maintained required capacity within height limitations two feet lower than originally specified. A

special short-stroke discharge valve was designed to operate within the reduced space. The bottom-entering agitator drive mechanism had to be removable through the restricted clearance above the floor for easy servicing . . . without moving the blender.

The solution of this liquid blender problem is typical of the custom service available to the chemical process industries from Dravo Corporation. Special and large-scale equipment is designed and fabri-

cated to meet particular production requirements in the chemical, food, rubber, plastics and allied fields.

Send for Process Equipment Bulletin No. 236. Write to Dravo Corporation, Pittsburgh 25, Pa.

DRAVO

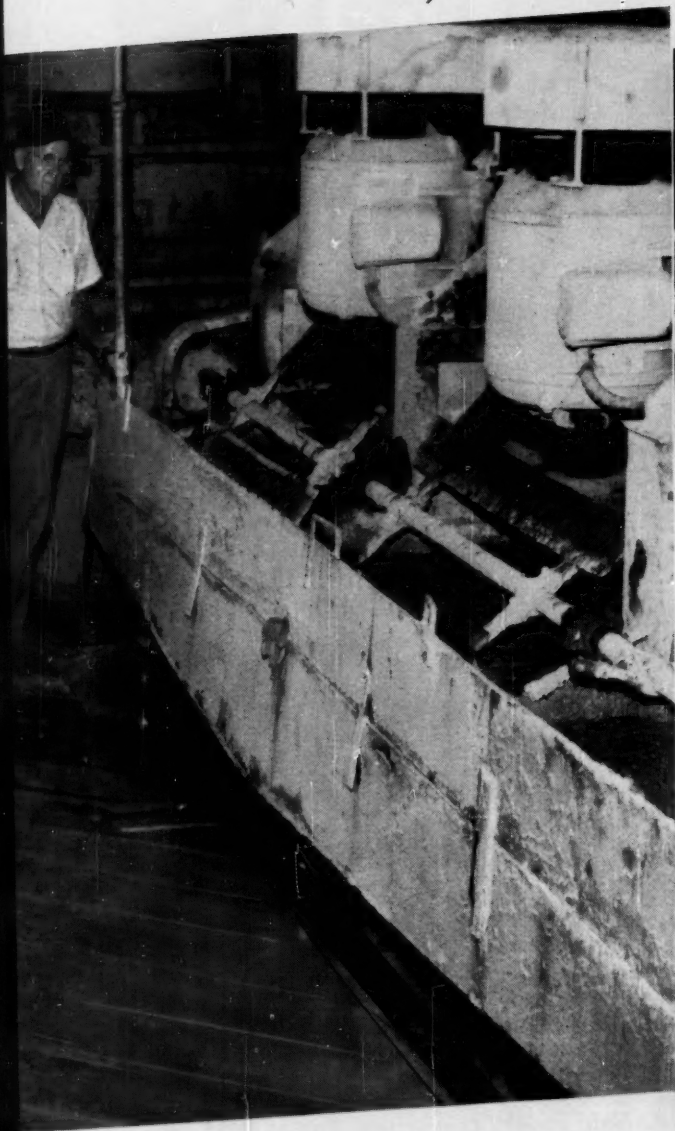
C O R P O R A T I O N



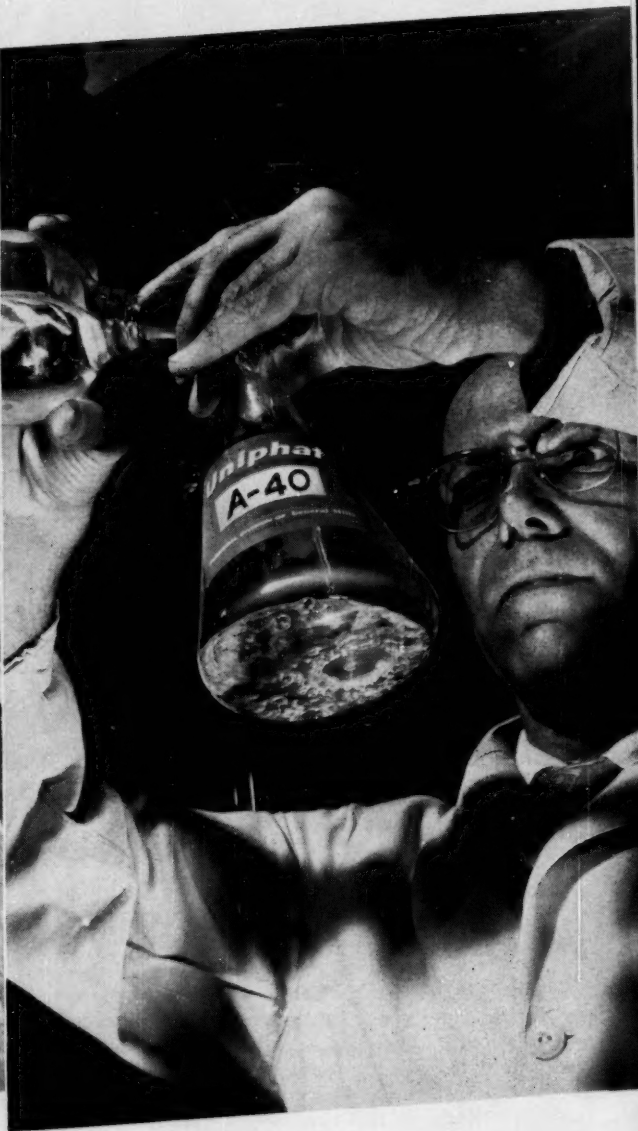
Blast furnace blowers • boiler and power plants • bridge sub-structures • cab conditioners • docks and unloaders • dredging • fabricated piping foundations • gantry and floating cranes • gas and oil pumping stations • locks and dams • ore and coal bridges • process equipment • pumphouses and intakes • river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation

More
Opportunity
Chemicals from
General Mills

Here's proved add new value



FATTY NITROGEN COMPOUNDS PROVED IN ORE FLOTATION. Flotation reagents from General Mills make it practical to reclaim lean ores at low cost. Cationic surface active reagents like our *Alamacs* and *Alamines* separate the useful ore from worthless gangue. Specific flotation compounds for various ores are included in the complete line of organic chemicals uniformly made by General Mills to serve industry.



METHYL ESTERS PROVED IN CHEMICAL REACTIONS. *Uniphats* (General Mills Methyl Esters) fractionally distilled from coco fatty acids, are non-corrosive, easily stored and handled. They are excellent long-chain "building blocks" in the route to producing resins, detergents, lubricants, plasticizers, many other products. Clear and light in color, most are liquid at room temperature. Investigate these inexpensive intermediates for scores of important chemical reactions. Available in tank car quantities.

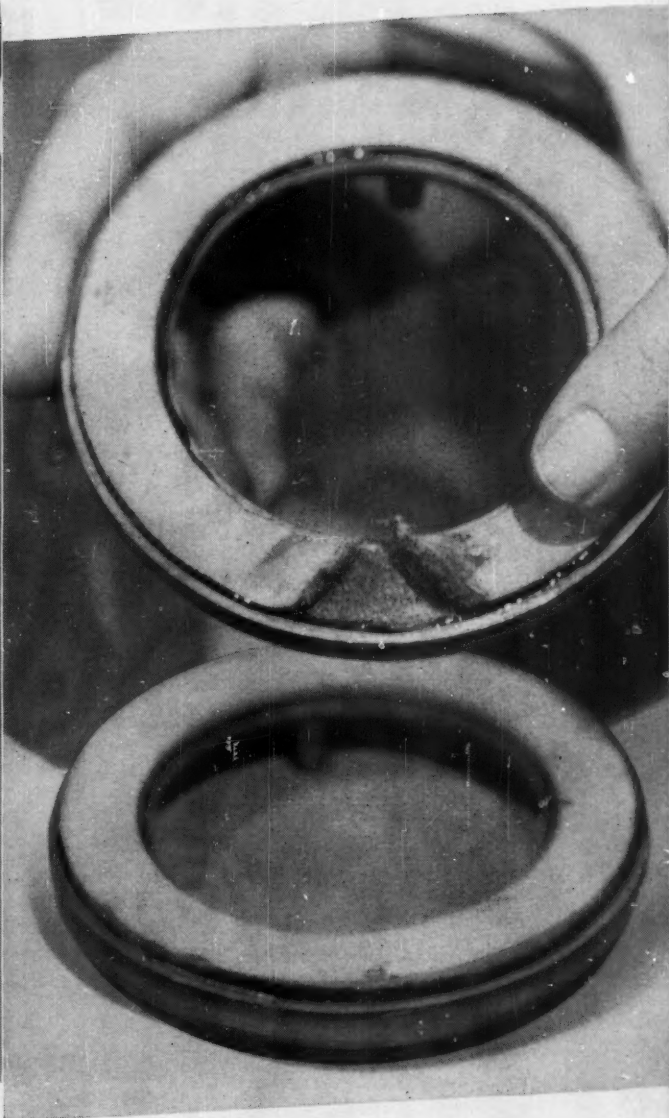
WRITE FOR MORE INFORMATION... see how General Mills "opportunity" chemicals can help you!

CHEMICAL DIVISION OF

performance which can to your products



FATTY ACIDS PROVED IN PAINTS. High quality, uniform *Aliphats* (General Mills Fatty Acids) are the choice of coating vehicles manufacturers who want the correct raw materials for the best possible product. *Aliphats* make excellent air drying and baking alkyds. They feature a full selection of acids derived from soybeans, cottonseed, coconut, corn and tall oil. When initial color, color stability, drying characteristics and other essential film requirements must be met . . . turn to General Mills, a reliable source of Fatty Acids.



VERSAMID POLYAMIDE RESINS PROVED IN ADHESIVES. The bond held, but this leather gasket tore when an attempt was made to separate it from the brass ring. The assembly was bonded with a *Versamid* based adhesive and subjected to oil, gasoline and heat by friction without signs of failure to the bond. *Versamid* adhesives solve scores of tough bonding problems economically. (Note: General Mills does not manufacture adhesives . . . only the *Versamid* polyamide resins that make such superior adhesives possible).

General Mills

KANKAKEE, ILLINOIS

General Mills is a dependable source of supply for these organic chemicals:

- *Versamid*
- Polyamide Resins
- Fatty Nitrogens
- Fatty Acids
- Methyl Esters of Fatty Acids
- Tall Oils
- Sterols

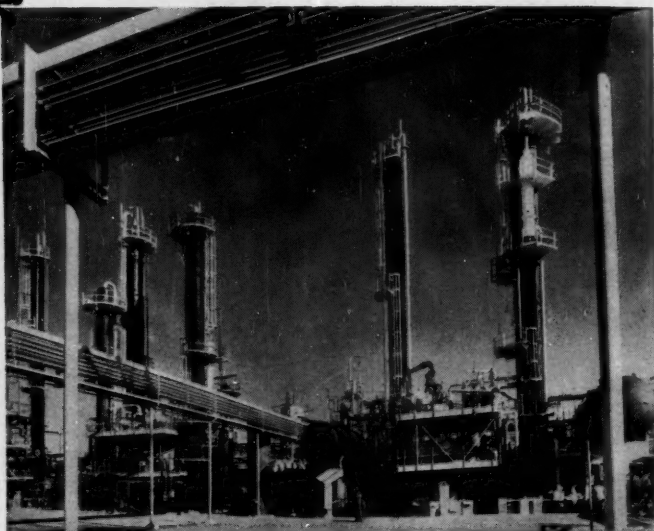


This picture of the old-fashioned sprinkler cart typifies the uneconomical methods of delivery which have given way to modern, streamlined distribution systems. (Print from the Bettman Archive)

PHENOL DELIVERY HAS OUTGROWN 'HORSE AND BUGGY DAY' METHODS

Hercules' distribution methods for phenol are as modern as the new plant at Gibbstown, New Jersey, where it is made.

Prompt shipment in tank cars, tank trucks, or drums is always available from the East's newest phenol plant. And the delivery of high-quality U.S.P. Synthetic phenol by tank truck in molten form may well save you time and labor. We'll be glad to discuss this service with you.



HERCULES



Oxychemicals Division
Naval Stores Department
HERCULES POWDER COMPANY
INCORPORATED

992 Market Street, Wilmington 99, Del.

HO56-4



BETWEEN SESSIONS: Traffic's busy at CSMA meeting, where the . . .

Accent's on New Products

Springlike weather, a CSMA election year, and a host of new products brought a record registration to the 43rd annual meeting of the Chemical Specialties Manufacturers Assn. in Washington, D.C., last week. Close to 900 attended the three-day session at the Mayflower Hotel.

The majority of papers were devoted to technical subjects; new products were introduced largely by word of mouth. Among the new items they were talking about:

- A new, all-aluminum aerosol container by Peerless Tube Co. (Bloomfield, N.J.) for cosmetic packaging. Available in 16-cc. and 2¼-oz. sizes, the epoxy-lined, impact-formed container features a less-than-a-nickel unit cost (considerably under Peerless's previously offered package).

- Sesoxane, a new synergist for pyrethrins-containing insecticide formulations, introduced by Shulton, Inc. Shulton actually revealed commercialization of the USDA-developed compound [2-(2-ethoxyethoxy) ethyl 3,4-methylenedioxyphenyl acetal of acetaldehyde] the day after the CSMA meeting (for full story, see p. 92).

- TCC, 3,4,4'-trichlorcarbanilide Monsanto's new bacteriostat for soap, now in pilot-plant manufacture. Effective

against gram-positive organisms, it's insoluble, generally "micronized" and suspended in soap—but it reportedly permits the manufacture of pure white soap bars. At \$2/lb., it's more expensive than Monsanto's Actamer bacteriostat.

- Cyanuric acid, and its derivatives, from Wymat Chemical Corp. (Kearney, N.J.). Suggested uses include formulation of chlorine-releasing abrasive cleaners.

And there were a number of products, not strictly new, that were getting plenty of attention:

- Du Pont is trying to bring the nylon plastic aerosol container closer to commercial reality with a new nylon molding resin, Zytel 42. This material, tougher at melt temperatures than previously offered nylons, seems suitable for blow-molded containers. Among the firms showing interest in this are National Plastics Products (Odenton, Md.) and the molded products division of Continental Can Co. (Continental, incidentally, will soon be producing a plastic-coated glass aerosol unit; its Hazel-Atlas subsidiary has licensed Wheaton Glass Co.'s coating process.)

- Dow is pushing use of its Chlorothene, an inhibited form of methyl

chloroform, for use in aerosols. A low-toxicity solvent, it's offered as a vapor-pressure depressant when used with propellant 12. Typical use: in hair lacquer formulations.

Division Highlights: Besides the new synergist Sesoxane, insect attractants gave insecticide formulators something to think about. V. G. Dethier, of Johns Hopkins, pointed out that so far little has been done with attractants—he does not consider sugar-bait insecticides as utilizing attractants, since sugar does not "reach out and lure" a fly. On the other hand, geraniol does draw Japanese beetles, methyl eugenol does fetch the oriental fruit fly, and an alcohol called gyptal does lure gypsy moths and silkworms. Chances are that incorporation of some of these attractants in future formulations of insecticides will boost effectiveness.

The sessions of the soap and detergent makers reflected the increasing interest in heavy-duty liquid syndets. As Fred Woodward, of General Aniline and Film Corp., pointed out, makers of the laundry liquid face two related problems: it's difficult to make a liquid that will wash well and yet remain stable.* The problem hasn't yet been completely solved, but Woodward feels GAF's new Igepal C0630 and Alipal C0436 go a long way toward solving it.

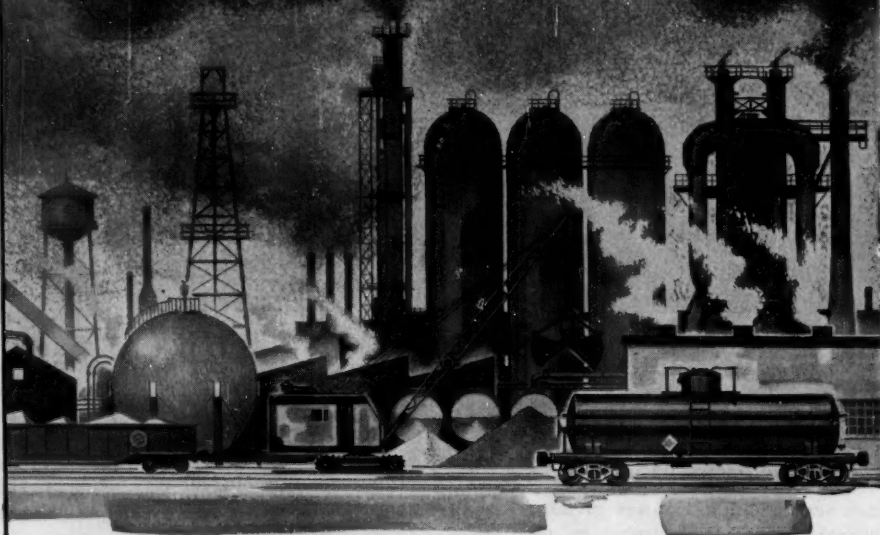
Soapers also listened to new ideas in the formulation of cationic laundry softeners—products added to the laundry rinse water to provide a soft, fluffy finish. Armour & Co.'s Paul Du Brow showed what that firm offers in cationics for the softeners.

Among aerosolers, perhaps the greatest interest centers around water-based emulsion formulations. General Chemical's Lee Callans brought the interest to focus with a paper on that firm's studies in propellents suitable for such formulations. Basically, the general feeling is that a water-based formulation, often in combination with the hydrocarbon propellents (not fluorinated propellents) can provide such low-cost products that a host of new products can soon be marketed. The most widely cited example of this is Bon Ami's new window cleaning aerosol.

*Woodward boils the problem down like this: a load of washing water should contain at least 0.1% alkyl benzene, 0.1% phosphates in order to wash clothes well. It's difficult to get a liquid formulation in marketable, stable form that will provide these materials.

IS YOUR INDUSTRY LISTED HERE?

Abrasives
 Aeronautical
 Automotive
 Brick and Tile
 Ceramic
 Cement and Concrete
 Cosmetic
 Disinfectants
 Electrical Manufacturing
 Electroplating
 Enamel
 Engraving and
 Electrotyping
 Feed Stuff, Mineral Feed
 Fertilizer
 Food
 Glass
 Insecticide and Fungicide
 Laundry
 Leather
 Lithographing
 Linoleum and Floor
 Covering
 Lubricant
 Match
 Metallurgical
 Metal Working
 Oil Cloth
 Optical
 Paint, Varnish and Lacquer
 Paper
 Petroleum
 Pharmaceutical
 Photographic
 Porcelain Enamel
 Plastics
 Pottery
 Printing Ink
 Pyrotechnic
 Refractories
 Rubber
 Shade Cloth
 Soaps
 Textile
 Veterinary Remedies
 Welding Electrodes
 Wall Paper



HARSHAW CAN SERVE YOU!

**Harshaw sells chemicals — thousands of them —
for these and many other industries**

Here are typical Harshaw chemical products

Electroplating Salts, Anodes
and Processes

Organic and Inorganic Dry
Colors and Dispersions

Driers and Metal Soaps

Vinyl Stabilizers

Ceramic Opacifiers and
Colors

Fluorides

Glycerine

Preformed Catalysts, Catalytic
Chemicals

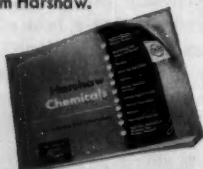
Synthetic Optical Crystals

Agricultural Chemicals

Fungicides

Chemical Commodities

FREE! This 16-page booklet
lists the many chemicals available
from Harshaw.



**WRITE TODAY FOR
YOUR COPY**

THE HARSHAW CHEMICAL CO.

1945 EAST 97th STREET • CLEVELAND 6, OHIO

Chicago • Cincinnati • Cleveland • Hastings-On-Hudson, N.Y. • Houston • Los Angeles
Detroit • Philadelphia • Pittsburgh

SPECIALTIES

A rapid, instrument method of analyzing aerosol components was explained by G. Barr & Co.'s Morris Root and M. J. Maury. "Gas-liquid-phase chromatography" permits careful quality control by providing rapid analysis of propellents and volatile formulation components, and the detection of air in liquid and gaseous phases.

Du Pont offered another of its surveys of aerosol consumers, this time a study done by Daniel Starch and staff. Gist of the report was a gentle prodding of the industry. In spite of the fact that its sales have climbed to \$300 million in about 10 years, the public is still unaware that many products are sold in the pressurized form. Some 15 products, small sellers now, were studied by Starch.

Prize Luncheon: George Reddish, Warner-Lambert Pharmaceutical Co., received CSMA's 1956 Achievement Award for his pioneering in public health and in disinfection, and for antiseptic work.

Awards were made, too, to winners of the aerosol packaging contest. Picked as best-looking aerosol was Air Spray by Lactopine made by Swiss Pine Importing Co. (New York).†

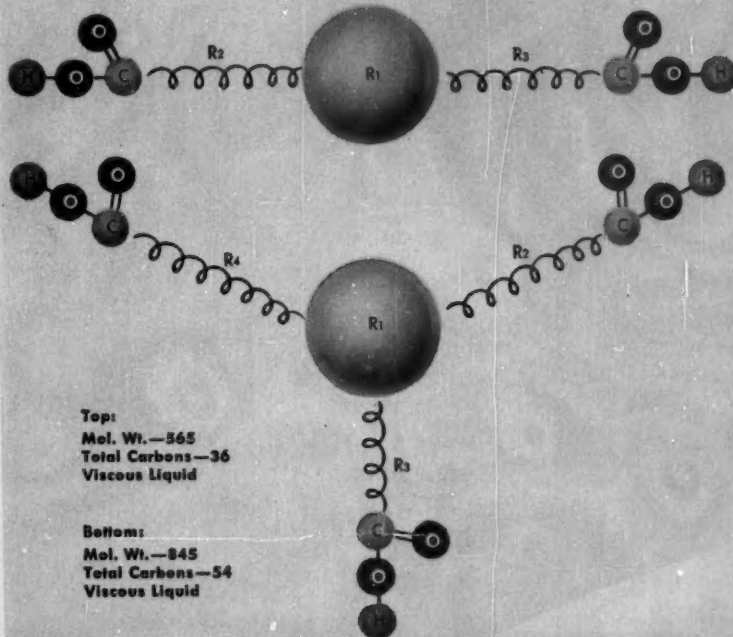
New Chief: New president of CSMA is Harry Peterson, Peterson Filling & Packaging Co. (Danville, Ill.), succeeding Lehn & Fink's Emil G. Klarmann. First vice-president is now James Ferris (Hooker Electrochemical Co.), and second vice-president, Donald M. King (Masury Young Co.). Pete Reilly (Reilly Tar & Chemical Co.) was re-elected treasurer, and H. W. "Doc" Hamilton continues as CSMA secretary.

Named to the association's board of governors were retiring president Klarmann, Anton Budner (S. C. Johnson & Son, Inc.), and Russell Puhle (Tykor Products Division of The Borden Co.).

Next CSMA meeting is slated for the Drake Hotel in Chicago, May 20-22, with next winter's session scheduled for Dec. 9-12 at the Hollywood Beach Hotel, Hollywood, Fla.

†Other winners: Bib Window Cleaner, a foreign entry by Society Elekal (Paris, France); Matinee Hair Spray, another non-U.S. entry, by Scent de Paris Co. (Toronto, Canada); Avon Moth Proofer, Avon Products, Inc. (New York); Krylon Touch Up Spray Enamel, Krylon, Inc. (Norristown, Pa.); Rex Witch Hazel Shaving Cream, Rexall Drug Co. (Los Angeles); Tartan Sun Lotion, McKesson & Robbins, Inc. (Fairfield, Conn.); Christmas Snow Spray, R. J. Kerr Chemicals, Inc. (Park Ridge, Ill.); Easy Way Plastic Spray, Easy Way Products Corp. (Cleveland); Angelique Black Satin Spray Cologne, Angelique & Co., Inc. (Wilton, Conn.).

Want a Di- or Polybasic Acid that is DIFFERENT?



Then try EMPOL® POLYMERIZED ACIDS!

Relatively low in cost, these viscous liquids offer a very unusual combination of high molecular-weight and polyfunctionality that should be of extreme interest to manufacturers of resins, polyesters, polymers and similar type materials for many fields of application. Such fields already include adhesives, coatings, corrosion inhibitors, de-emulsifiers, emulsifying agents, films, foams, lube additives, elastomers and surface coatings.

In addition to commercial Empol 1022 which contains 75% dibasic and 22% tribasic acids, Emery offers several "development" grades that are essentially all dibasic or tribasic. This added flexibility of composition offers additional opportunities for research in new fields as well as the fields where the commercial product is already used. Mail coupon below for complete literature on Emery Polymerized Acids.



Organic Chemical
Sales Department

Emery Industries, Inc., Carew Tower, Cincinnati 2, Ohio

Emery Industries, Inc., Dept. I-12, Carew Tower, Cincinnati 2, Ohio

Please send literature on Emery Polymerized Acids. I am especially interested in ☐ dibasic, ☐ polybasic materials for.....

Name.....Title.....

Company.....

Address.....

City.....State.....

Plant yourself FRONT ROW CENTER...



FOR BETTER
MARKETING—

In B&O's Land of Big Opportunity

The nation's growth statistics prove the B&O area is the focal point of population weight and the center of the top industrial areas—with the lion's share of Standard Metropolitan Markets.

For distribution purposes this means B&O's Land of Big Opportunity provides front-row spots for your plant. We can show you an acre or a thousand, strategically placed to better your national distribution.

Look them over with a B&O plant-location man . . . or see them at your desk in 3-dimensional color and air views. Ask our man!

YOU CAN REACH HIM AT:

BALTIMORE 1—LEXington 9-0400

NEW YORK 4—Digby 4-1600 CINCINNATI 2—DUnbar 1-2900

PITTSBURGH 22—COurt 1-6220 CHICAGO 7—WABash 2-2211



Baltimore & Ohio Railroad

Constantly doing things—better!

THIS
SPECIAL STUDY
ON REQUEST

From the
B&O RAILROAD,
BALTIMORE 1, MD.



SPECIALTIES

Add Bioflavonoids

Grove Laboratories (St. Louis) and the Food & Drug Administration got together last week in Washington, D.C., to hash over the flaring controversy about the effectiveness of citrus bioflavonoids in cold treatment (*CW*, Dec. 15, p. 38). At the meeting, which the Federal Trade Commission attended, too, it was agreed that Grove will tone down the ads it has been using to push its Citroid cold remedy. A Grove spokesman termed the conference "harmonious," and added: "We expect to come out with perfect agreement before long."

In the meantime, Sunkist Growers rushed the printing of a special issue of its "Nutrition Research" journal featuring clinical evaluation of the citrus bioflavonoids. Besides covering the treatment of common cold, the journal devoted considerable space to a review of papers on the use of bioflavonoids in cases of capillary stress, as anticoagulants, in the treatment of rheumatic diseases, allergy, hypertension, genitourinary and respiratory diseases, habitual abortion (miscarriage), and effects on metabolism.

House that Soap Built

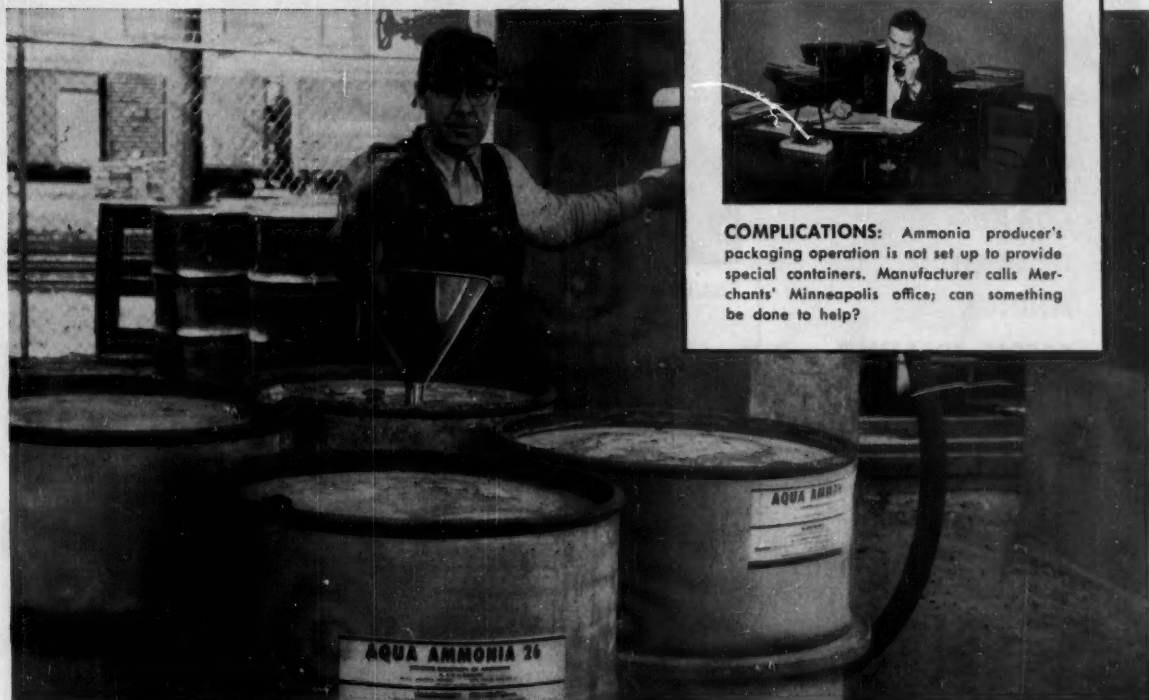
Procter & Gamble showed off its new headquarters building in Cincinnati last week and became the last of the major soapers to complete its shift to a new home. Lever started it all back in 1952 when it moved to its spectacular glass-and-steel building on New York's Park Ave. Colgate followed a year or so later, with a modern structure just down the street from Lever House. But P&G refused to move to the big city; instead, it erected smart new general offices in its home town of Cincinnati.

Eleven stories of limestone and dark-gray granite, the new P&G building was "designed from the inside out." Each operating section listed its present requirements, and its estimates of future needs for space. Results of work-flow and foot-traffic studies then determined where each section should be located. The building offered some 320,000 sq. ft. of space with which to work.

P&G designed the structure primarily for interior flexibility, appears to have spared nothing to promote work efficiency.

SPECIAL SERVICE FROM MERCHANTS

*solves customer's
contamination problem*



SOLUTION: Merchants sends over its own stainless steel drums and polyethylene containers for filling by the ammonia producer, delivers

them to the manufacturer. Contamination problem is licked, thanks to Merchants' most important product — service.

Large chemical producers are primarily in the business of making chemicals. Merchants *sells* chemicals—sells them by offering service tailored to the individual customer. Your supply problem—whether it's special containers, special delivery, or

special technical help—can be solved best by a call to Merchants Chemical. Products include acids, alkalis, fungicides, surfactants, chlorinated solvents, emulsifiers, laundry compounds, soaps, dry ice and chemical specialties.



MERCHANTS CHEMICAL COMPANY, INC.

60 East 42nd Street, New York 17, N. Y.

SALES OFFICES AND WAREHOUSES: Chicago • Cincinnati • Denver • Louisville • Milwaukee • Minneapolis • New York • Omaha

STOCK POINTS: Albuquerque, N. M. • Erwin, Tenn. • S. Norwalk, Conn. • Columbus, Ohio

A WIDE SELECTION OF WAXES

provides answers to many wax problems. If you have a wax problem, bear in mind that Bareco Wax Company products currently are being used for

POLISHES
WRAPPINGS
LAMINATING
IMPREGNATING
COATING
INSULATION
LININGS
FABRIC TREATING
LEATHER DRESSING
TEXTILE SIZE
COSMETICS
WATERPROOFING
PRINTING INKS
CARBON PAPER
CANDLES
RUST PREVENTION
LUBRICANTS
GREASE
DENTAL WAX

If we don't have a wax that exactly meets your need, we'll custom-refine one. Just let us know your problem.

BARECO WAX COMPANY



Box 390, Kilgore, Texas
Box 2009, Tulsa, Okla.

A DIVISION OF
PETROLITE CORPORATION

Sales Offices: NEW YORK, 150 E 42nd St., Suite 3432-36
PHILADELPHIA, 121 S. Broad Street
CHICAGO, 332 S. Michigan Avenue

B56-7

SPECIALTIES



SHULTON'S PARKER, HARDWICKE: Piperonal pointed the way.

Found: Synergist Shortcut

They had scarcely adjourned the meeting at the Insecticide Division of Chemical Specialties Manufacturers Assn. last Wednesday afternoon when the word got around that the powerful new synergist for pyrethrins, tested and developed by John Fales, O. F. Bodenstein and Morton Beroza of the U.S. Dept. of Agriculture, was not just a laboratory curiosity; Shulton, Inc. (Clifton, N.J.) was offering test quantities from pilot-plant production.

Sesoxane,* as Shulton calls its new synergist, has heretofore been made by a complex, costly method, practical only for producing lab-test quantities. Shulton's Lee Parker and Jim Hardwicke worked out a shortcut synthesis based on the already-commercial synthesis of piperonal (also termed heliotropine). Result, according to Shulton, is that the Sesoxane is now in a price range where it can readily compete with such well known synergists as sulfoxide and piperonyl butoxide. And its synergistic properties, as proved out by USDA researchers, make it a rugged competitor indeed:

- Sesoxane has shown unequaled activity (rapid knockdown) with pyrethrins, allethrin, cyclothrin.

- It is readily soluble in kerosene, propellents 11 and 12, and a variety of other materials (low solubility limits use of one commercial product now). It is, in a word, easy to formulate.

- It has a faint, pleasant odor—nasal irritation, the shortcoming of one of the widely used products now available, has been virtually eliminated.

- It gives high over-all insect kill, permits formulators to leave out chlorinated insecticides, as well as reduce the amount of expensive pyrethrins used.

- It has low oral toxicity.

Head Start: Shulton makes no secret of the fact that it felt it had a head start by virtue of its long experience in piperonal manufacture. It makes the latter by treating *ocetea cymbarum* with caustic potash to get isosafron, which it then oxidizes to piperonal.

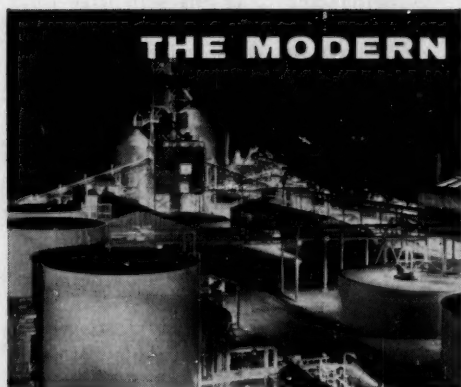
Shulton treats the piperonal with peracetic acid and acetic anhydride, gets sesamol acetate, which is hydrolyzed to sesamol. Treating sesamol with vinyl ethyl carbitol yields the sesoxane, a thin light-brown liquid.

It appears that the activity of the

*The compound is termed 2-(2-ethoxyethoxy) ethyl 3,4-methylene dioxypheyl acetal of acetaldehyde by USDA, and 2-(3,4-methylenedioxyphenoxy)-3,6,9-trioxaunderane by Shulton.



LITHIUM



San Antonio, Texas plant of American Lithium Chemicals, Inc., processing lepidolite ore into lithium hydroxide and other chemicals.

THE MODERN ALCHEMIST *changes things for the better!*

Every day, through modern chemistry, the addition of lithium is changing products for the better. In many areas—notably in glass, ceramics, multi-purpose greases, alkaline storage batteries, air conditioning and heat treating—lithium is reaching out with its magic touch to add superiority to the product or improvement to the process. American Potash & Chemical Corporation is a leading producer of lithium in many forms. Its Trona and Los Angeles, California plants produce lithium carbonate, lithium chloride and lithium bromide. AP&CC's subsidiary, American Lithium Chemicals, Inc., at San Antonio, Texas, makes lithium hydroxide from high-grade lepidolite ore. We suggest you take a good look at the versatile properties of lithium...and in so doing, remember Trona® lithium products are backed by years of pioneering experience and extensive production facilities.

American Potash & Chemical Corporation

LOS ANGELES • NEW YORK • ATLANTA • SAN FRANCISCO • PORTLAND (ORE.)



Producers of: Lithium Carbonate • Lithium Hydroxide
• Lithium Chloride • Lithium Bromide • Borax • Potash
• Soda Ash • Salt Cake • Bromine • Chlorates • Perchlorates
• Manganese Dioxide • Agricultural and Refrigerant Chemicals

Plants: TRONA and LOS ANGELES, CALIFORNIA
SAN ANTONIO, TEXAS (American Lithium Chemicals, Inc.)
HENDERSON, NEVADA

Export Division: 99 Park Avenue, New York 16, New York



DAVENPORT

PRESSING — DRYING
and
COOLING Equipment

Continuous DeWatering
Presses

ROTARY DRYERS
Steam Tube, Hot Air
and Direct Fire

Atmospheric
DRUM DRYERS

ROTARY COOLERS
Water and Air

The *New* 1B "DAVENPORT" Continuous De-Watering Press

This new press was designed and built to withstand the extremely heavy service required in the Pulp and Paper Field. This same press can be adapted to many other products that have a fibrous nature. This press can also be readily adapted to products having a highly corrosive element.

Let our engineers consult with you on your Pressing,
Drying, and Cooling problems, or send for complete
Catalog B

davenport MACHINE and
DAVENPORT, IOWA U.S.A. FOUNDRY COMPANY

GLYCOLS

DIETHYLENE GLYCOL
DIPROPYLENE GLYCOL
ETHYLENE GLYCOL

HEXYLENE GLYCOL
PROPYLENE GLYCOL
TRIETHYLENE GLYCOL

• Delivery from local stocks



McKESSON & ROBBINS

INCORPORATED
CHEMICAL DEPARTMENT

NATIONWIDE distributors of heavy and fine chemicals

Atlanta • Boston • Buffalo • Burlington • Cedar Rapids • Chicago • Cleveland • Dallas
Davenport • Decatur • Des Moines • Detroit • Houston • Los Angeles • Milwaukee • Mobile
New York • Omaha • Peoria • Philadelphia • Phoenix • Pittsburgh • Quincy • St. Louis
St. Paul • San Antonio • San Diego • Sioux City • Wichita

SPECIALTIES

Sesoxane derives from two features of the molecule — a dioxymethylene bridge on the benzene ring, and the ether linkage between the benzene and the alkyl chain. These seem to foster unmatched synergistic activity.

But the compound is also very active, chemically. Shulton is plainly planning to capitalize on this reactive compound, which could well be the intermediate for numerous other compounds.

PRODUCTS

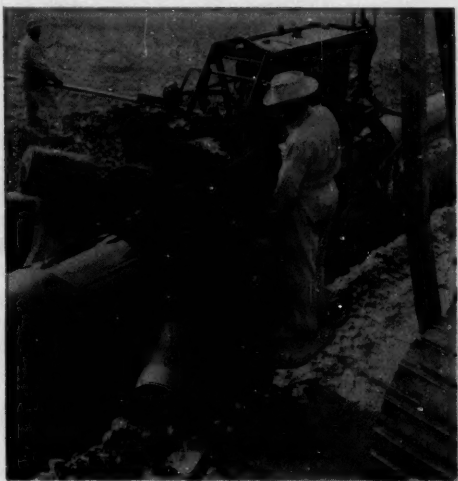
Paint Tester: A new electrohydraulically operated lacquer- and paint-testing machine has push-button controls for speeding up testing. A product of A. M. Erichsen, G. m. b. H. (Hemer-Sundwig, Germany), the device determines elasticity, adhesiveness, porosity and aging of coatings. Its normal cupping speed (0.47244 in./minute) can be increased to 14.17 in./minute.

Flow Coat: Instantaneous bubble release and an ability to "hang" well on sharp edges and holes are claimed for a new series of flow-coating finishes now offered by Interchemical Corp. Designated IC Ultraflo, the primers and enamels are designed for one-coat finishing of objects with large areas and long flow surfaces (e.g., refrigerators). According to Interchemical, the finishes require only a short time in the solvent chamber, a minimum of supplemental spray, one reducer, no expensive additives.

Low Pressure: An aerosol spray nozzle for conventional 2-phase and ultra-low-pressure products has been patented by Risdon Manufacturing Co. (Naugatuck, Conn.). Trademarked Micro-Mist, the nozzle is designed for use with water-base and other products that don't mix with a propellant. Claims: it gives wider-cone, drier, and finer spray (i.e., contents last longer) than previous nozzles of this type.

Silicone Glove: A new silicone-lanolin hand cream, in a 98¢ aerosol, is offered by Sprayway Inc. (Chicago). Called Lanosoft, the new product is said to give glove-like protection—a claim also made by other hand-care materials.

• Cutex Hand Cream, another silicone-lanolin product comes in a jar. Made by Northam Warren Corp.



**Vital
protection...**

**...for a very
vital
operation!**



WE'LL bet the chief cook at your house has never seen a big inch gas line—let alone one being coated with coal tar enamel. Yet, that fraction-of-an-inch of tough, durable protection against corrosion is one of the reasons why she can always depend on her natural gas supply . . . and at a reasonable cost, too.

Coal tar coatings are the best practical protection the pipeline industry has found for its multi-million dollar investment in underground transmission lines. Pipelines laid a quarter of a century ago have been unearthed and found in perfect condition, thanks to their impervious coal tar "skins."

Today, oil and gas lines all over

the nation are being protected with Pitt Chem coal tar coatings, one of the principal products of Pittsburgh Coke & Chemical Company's Protective Coatings Division. These hot-applied coatings are known for their uniform top quality and ready availability in grades for every application and service condition.

On another corrosion-fighting front, Pittsburgh recently introduced *Tarset*, the first relatively low-cost cold-applied coating ever developed to effectively protect equipment against crude oil corrosion. *Tarset* also shows exceptional promise in combating severe chemical and marine corrosion.

If you have an unusual corrosion

problem, perhaps you'll find a practical answer in the versatile family of Pitt Chem protective coatings. Let us acquaint you with the unique advantages of buying your coal derived products from Pittsburgh, a basic and integrated producer.



WSW 6117

COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

December 15, 1956 • Chemical Week

95



Solvent Recovery...

rendered on a toll basis or on an outright purchase of the starting by-product.

The facilities and experience of Truland may be employed advantageously for the economical upgrading and disposal of organic wastes and by-products.

Our technically trained personnel are available to discuss the refining of any organic waste or by-product.

Send ... for new booklet

which describes our

operation



Division of THE TRUBEK LABORATORIES Incorporated

SPECIALTIES

(Stamford, Conn.), it normally sells for 59¢ a jar, but is being introduced in a package with a free 29¢ jar.

Marked Man: The English have developed a police truncheon which will eject an indelible violet dye. Thus marked, the criminal has a hard time getting lost in the crowd. Price of the device (about \$16) includes free servicing and reloading, and a liability insurance policy covering accidental or inaccurate discharge.

Hair of the Dog: Poynter Products, Inc. (Cincinnati, O.) is adding to the line it started with bourbon, rye and Scotch toothpaste. The new additions are Scotch and bourbon flavored mouth washes. The Scotch mouth wash, for instance, is made of Scotch whisky, imitation Scotch flavor, zinc chloride, menthol and saccharine. It comes in a 6-oz. brown jug, sells for \$1.95.

Capacity Clincher: By strengthening the weakest link—the valve clinching operation—in its aerosol filling line, Continental Filling Corp. (Danville, Ill.) has increased its plant capacity and speeded its output of spray cans. Responsible for this development is a continuous valve clincher that increases capacity fivefold—to 300 cans/minute.

Wax Line: E. L. Bruce Co. (Memphis, Tenn.) has revised its line of industrial and institutional floor-care products. The new line has four self-polishing waxes and two cleaners. Waxes: heavy-duty Bruce Chieftan (18% solids), slip-resistant Bruce Celtic (with Ludox); general-purpose Bruce Tartan; water-resistant Bruce Aqua-Shield. Cleaners: neutral Bruce Red Plaid (liquid synthetic detergent), and Bruce Wax Remover. Also included are heavy-duty versions of the firm's home products: Bruce Floor Cleaner, Cleaning Wax, Paste Wax, Tuf-Lustre Wax.

Filler Shares: Exclusive sales rights to Continental Filling Corp.'s Meelium deodorant have been acquired by Prentiss Drug & Chemical Co., Inc. (New York). Continental reports it has filled over 10 million aerosols with the deodorant since 1951. This is the first time the product has been made available to other fillers.



for improved production

of esters, amides, ketones, peroxides,
ureides and many other acid derivatives.

A

ACID CHLORIDES (RCOCl)

Available carload, less carload

Acetyl Chloride
Butyryl Chloride
Caproyl Chloride
Capryloyl Chloride
Cinnamoyl Chloride
Lauroyl Chloride
Myristoyl Chloride
Palmitoyl Chloride
Phenylacetyl Chloride
Propionyl Chloride
and
others, made to order

In many cases, acid chlorides are indispensable. Advantages include better yields and conversions, shorter reaction times, lower reaction temperatures and lighter colored finished products:

Amides from amines or amino acids • Ureides from ureas
Esters from alcohols • Peroxides from sodium peroxide
Ketones from aromatic hydrocarbons

INTERMEDIATES DIVISION

The TRUBEK LABORATORIES Inc.

Established 1932

EAST RUTHERFORD

NEW JERSEY



More Colorful for Christmas— Thanks to Atlantic Ultrawets

Color—just the right color—often makes all the difference between clothing that *sells* and clothing that stays on the sales counter. These Christmas ties are more colorful, and more profitable, because the dyes have penetrated easily and evenly.

That's where Atlantic Ultrawets come into the picture. With Ultrawets in the dye bath, the fibers drink up the dye with all its intense color and sales appeal. The Ultrawets are members of the fast-growing family of petrochemicals made by The Atlantic Refining Company—so you see the miniature refinery along with the ties.

Today, capable, versatile Ultrawets are important in formulations for scores of uses, from industrial wetting agents to household detergents. And industry is constantly finding profitable new uses—in new products, in cost-saving manufacturing advantages, in adding new sales appeal to well-established products.

Atlantic sales engineers are always ready to help your staff get the most from your use of Atlantic petrochemicals. For full information, write The Atlantic Refining Company, Dept. H-12, 260 South Broad Street, Philadelphia 1, Pennsylvania.



PHILADELPHIA
PROVIDENCE
CHARLOTTE
CHICAGO

In the West: L. H. Butcher Co.

In Canada: Naugatuck Chemicals
Division of Dominion Rubber Company, Ltd.

In Europe: Atlantic Chemicals SAB,
Antwerp, Belgium

In South America: Atlantic Refining
Company of Brazil, Rio de Janeiro

Market Newsletter

CHEMICAL WEEK
December 15, 1956

Trade talk about a sulfur price boost is groundless, aver U.S. sulfur producers; any likely increases in the foreseeable future will affect only foreign markets that may have to absorb increased freight rates.

That a stable supply/demand balance exists in the domestic sulfur market will also be indicated by year-end figures—to be released in a week or two; though both consumption and output of sulfur this year will be up from '55's, greater gains will probably be noted in the production column.

There's more sulfuric acid available this year, too, than there was last year, and additional acid facilities due in next year will further hike the supply. In fact, a few pessimistic market followers are predicting some sales worries for producers during parts of '57.

On the other hand, high-stepping outlets like synthetic detergents, pigments, steel, rayon, chemicals—despite the expected continued slowness in fertilizer acid use—may well be brisk enough to keep the sulfuric excess in line, with no change in price—at least through the first quarter.

But a host of other chemical prices will go up on or before Jan.

1. For example, last week Du Pont and Heyden handed out a bundle of three increases—for formaldehyde, paraformaldehyde, and hexamethylene tetramine. Other producers will follow suit.

The new tabs, effective January 1: Tank quantities of 37% formaldehyde will go up by 25-30¢/cwt., depending on methanol content; paraformaldehyde will go up 0.7¢/lb. across the board; hexamethylene tetramine will be 1.1¢/lb. higher, also across the board.

Incidentally, formaldehyde demand is barreling along, especially for phenol- and urea-type formaldehyde resin manufacture, and there's little letup in sight. The growing need had been anticipated, sparked last year's raft of expansion plans that are now beginning to pay off in increased availability.

There'll be a fairly wide gap between formaldehyde capacity and production as the former stretches toward 2.6-plus million lbs./year (*CW*, Dec. 17, '55, p. 94), but few producers are worried. Traditional attitude among makers is to regard such "overcapacity" as insurance against increasing formaldehyde requirements rather than as an industry extravagance.

On the downside, a 2½¢/lb. across-the-board price slash on paradichlorobenzene brought carload (200-lb. drums) tags to 12¢/lb.

Market Newsletter

(Continued)

For smaller drums, in carlots, the following prices were quoted: 100-lb. drums, 13¢/lb.; 50-lb. drums, 14¢/lb.; 25-lb. drums, 15¢/lb.

The cuts are being regarded in the trade as realistic moves on the part of manufacturers, and as reflecting the rather sharp competitive condition of the market. The material, used extensively in insecticidal and germicidal preparations, has been on the long side for some time. There may be a pickup in use by spring, but observers note that demand during what have previously been considered peak seasons hasn't been heartening.

Probably underscoring the contention that an ample nickel supply is still a good year or two away (*CW*, Nov. 10, p. 78) is last week's unprecedented 9½¢/lb. boost in prices—to 74¢/lb.—to U. S. consumers. The hike was initiated by International Nickel Co. of Canada, Ltd., and includes the 1¼¢/lb. import duty paid by the company (Corresponding quote to Canadian users, at existing exchange rates, is 70¢ Canadian.)

Word of the increase, cited as "necessary in order to deal with higher costs and facilitate maximum production," came simultaneously with revelation of details about International's proposed \$175-million expansion project in northern Manitoba (*CW*, May 19, p. 154).

The development, within 3-4 years, will lift the company's "regular" annual capacity (256 million lbs.) by some 130 million lbs./year. The increase includes 106 million lbs. of new capacity plus an additional 24 million lbs./year of government-contracted output previously considered as "temporary" production.

An imminent impact on nickel chemical prices is expected by most market observers as a result of the higher metal tags. Chances are that sellers of nickel oxides and salts are even now figuring how the added costs should show on their price lists.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending December 10, 1956

UP

	Change	New Price
Ammonium acetate, purif., dms.	\$0.03	\$0.41
Castor oil, No. 1, Braz., tanks	0.005	0.225
Lead acetate, N. F., white cryst., gran., powd.	0.02	0.365
Lead nitrate, bbls., f.o.b., wks.	0.03	0.2675
Nickel metal, electro cathodes, cs., wks.	0.095	0.74
Potassium permanganate, coml., kgs., wks.	0.015	0.26
Potassium permanganate, USP, drms., wks.	0.02	0.2925
Sodium chloride, USP, 300 lbs. or more	0.03	0.08
Tankage, animal, feeding, 9-11% ammonia, bulk, Chicago, unit ton	0.25	5.50

All prices per pound unless quantity is stated.

formaldehyde isn't "formaldehyde" any more...

For low solids resins it's

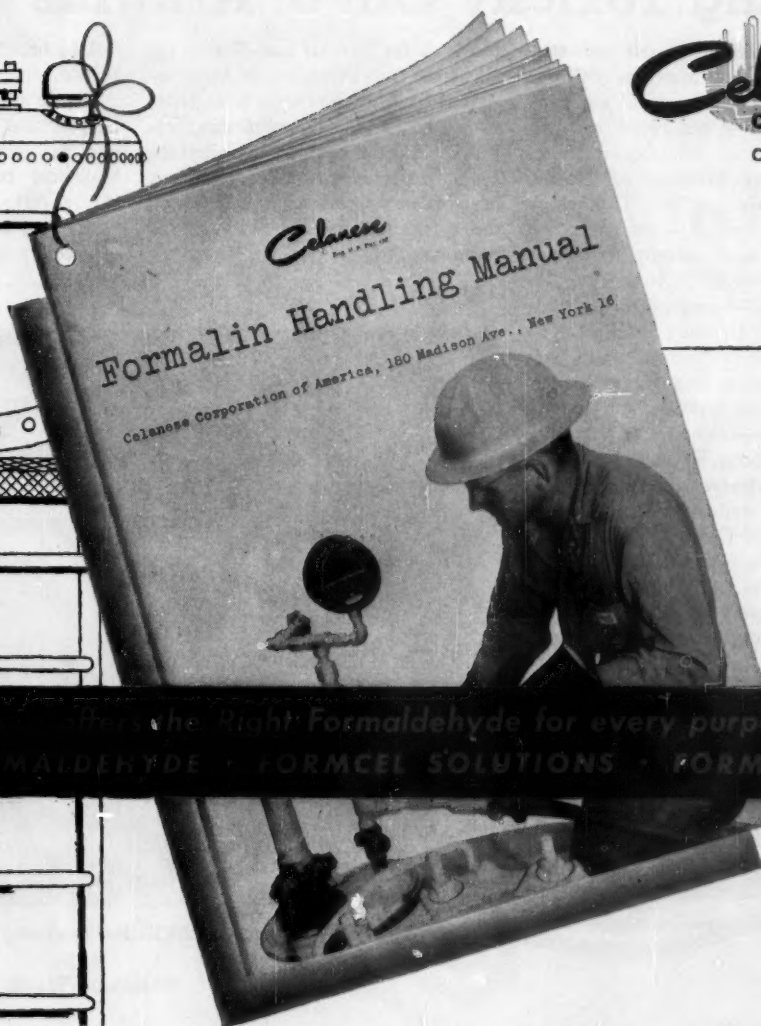
CELANESE FORMALIN

Formalin—one of the hard-working Celanese specialized formaldehydes—continues to be the right formaldehyde for low solids resins and adhesives. And the right source for Formalin is still Celanese integrated production that assures continuous supplies for all industries.

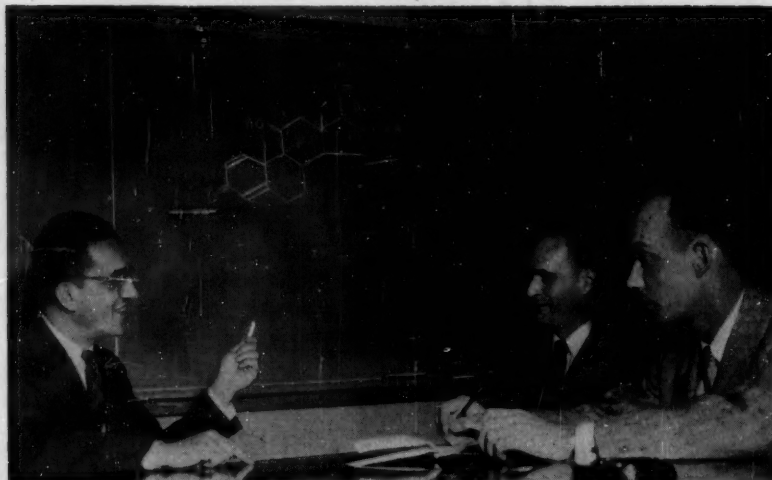
Revised Edition of Celanese Formalin Manual

The Celanese Formalin Handling Manual is a valuable reference for technical and non-technical personnel. Clear and concise, it covers storage, handling, analysis methods, safety precautions, temperature effects, and all other vital information for users of Formalin. Send for your free copy to Dept. 652-L, Celanese Corporation of America, Chemical Division, 180 Madison Avenue, New York 16, N. Y.

Export Sales: Amcel Co., Inc. and Pan Amcel Co., Inc., 180 Madison Ave., New York 16.



Only Celanese offers the Right Formaldehyde for every purpose...
PARAFORMALDEHYDE • FORMCEL SOLUTIONS • FORMALIN



LEDERLE'S BERNSTEIN, FELDMAN, LENHARD: In Orion, end of a hunt.

KEY: POSITION 16.

The 16-hydroxyl group — acetylated in the diagram — is believed to eliminate harmful side effects.

Taking Toxicity Out of Arthritis Drugs

Well-ensconced anti-arthritic steroids* may be in for a serious challenge from two new members of the family. Described at the recent meeting of the American Rheumatism Assn. —at National Institutes of Health, Bethesda, Md. (*CW Technology Newsletter*, Dec. 8)—the pair are Lederle's Orion, chemically, triamcinolone (9 α -fluoro-11 β , 16 α , 17 α , 21-tetrahydroxy- $\Delta^{1,4}$ -pregnadiene-3, 20-dione); and Upjohn's Medrol (6-methyl- Δ^1 -hydrocortisone). Both appear to overcome an undesirable side reaction of older systemic, anti-inflammation drugs—retention of salt and water in the body.

Potency Aplenty: After preliminary clinical trials, staffers of Sloan-Kettering Institute for Cancer Research and the Hospital for Special Surgery (both in New York City) call Orion at least as effective as currently available materials in controlling swollen and painful joints, stiffness and fever.

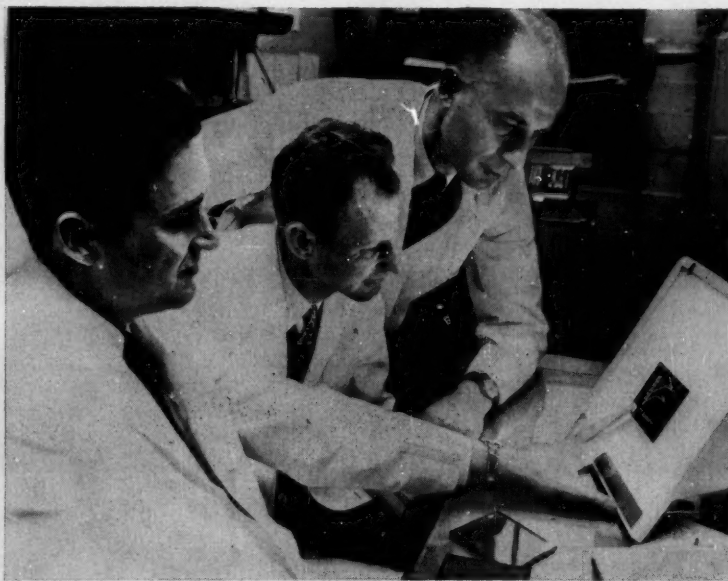
Lederle researchers, in the *Journal of the American Chemical Society* (Nov. 5, p. 5693), previously reported Orion's potency is 13 times that of hydrocortisone, and that it causes no sodium retention.

That is quite an achievement for a fluorinated steroid. Earlier such compounds have been highly active but

too toxic for internal use. Fluorinated cortisone derivatives, which were pioneered by E. R. Squibb & Sons (*CW*, June 13, '53, p. 50), are finding topical use against certain skin ailments. Later products of this type have been valuable primarily as clues in the quest for superior anti-arthritic hormones.

Upjohn, for instance, last year turned up 2-methyl-9 α -fluorohydrocortisone and 2-methyl hydrocortisone as potential substitutes for aldosterone in gauging steroid activity in biological research (*CW*, Dec. 31, '55, p. 60).

But the reasons for Orion's lack of toxicity are still somewhat of a



UPJOHN'S GLENN, SPERO, SEBEK: For synthesis, a microbiological assist.

*Cortisone, hydrocortisone, prednisone, prednisolone.



everything looks brighter now

Both operations were successful! While the surgeon cut downstairs, the painter brushed upstairs. The patient returns to a cheerful, newly painted room with dry walls and *no* paint smell . . . everything looks brighter now.

The painter used polyvinyl acetate paints formulated with GELVA emulsions. Odorless GELVA emulsion paints are extra fast drying, cure faster, and permit easy soap and water cleaning of equipment.

Shawinigan has successfully formulated GELVA emulsions for polyvinyl acetate paints since 1944. This unequalled experience combined with continuing research makes Shawinigan a name to remember in today's paint market. For full information write Shawinigan Resins Corporation, Dept. 1131, Springfield 1, Mass.

GELVA® emulsions for paints



mystery. Lederle's Seymour Bernstein, who headed the group that synthesized the compound*, believes that the 16- α -hydroxyl group is responsible.

Bernstein used a cortisone derivative as the starting material for Orion, terms the latter and its diacetate to be "the most active glucocorticoids hitherto reported that are devoid of sodium-retaining properties."

Speculation on Enzymes: E. Myles Glenn—spokesman for Upjohn's research team**—says Medrol has 12 to 18 times the potency of cortisone and hydrocortisone in fighting inflammatory diseases such as arthritis, but lacks the chief side effects of these drugs. Glenn speculates that Medrol's high potency may derive from its resistance to liver enzymes.

Synthesis of Medrol was accomplished by a combination of chemical and microbiological steps.

Market Upset? Advent of the new steroids† is causing conjecture about prospects for the anti-arthritis steroid market. Prednisone and prednisolone, developed by Schering (*CW*, Nov. 20, '54, p. 82), now share the bulk of the anti-arthritis steroid market by virtue of high efficacy, fewer side effects than cortisone and hydrocortisone.

One thing is certain, the commercial future of new drugs developed by Lederle (or Ciba) would be strongly influenced by the fact that these firms have no basic position in steroid production, would have to rely on outsiders for their raw material. At least one steroid market observer, New York consultant Norman Applezweig, thinks that in order for either of these companies to bring out an improved anti-inflammatory steroid in large quantity in a short time, "they might have to share the market with a large basic producer like Pfizer or Merck." Right now, all contenders for the crown held by the older anti-arthritis are still some distance from being commercial.

*Part of the Research Division, American Cyanamid Co., Lederle Laboratories (Pearl River, N.Y.). Members, aside from Bernstein, are organic chemists Robert Lenhard, William Allen, Milton Heller, Ruddy Littell, Stephen Stolar; biochemists Louis Feldman, Robert Blank.

**Medrol's synthesizers include Glenn, R. Stafford, W. Byrnes, S. Lyster, L. Barnes, G. Lund, M. Meinzinger, and B. Bowman (all of the department of endocrinology); G. Spero, J. Thompson, B. Magerlein, A. Hanze, J. Hogg (department of chemistry); H. Murray, O. Sebek (department of biochemistry).

†Sharp & Dohme and Ciba are also thought to be clinically testing new anti-arthritis. Squibb recently reported on 9,21-difluorohydrocortisone, claimed decreased salt retention.

For Research Management

... these titles are most popular, reflect degree of responsibility:

Title	Percent of research staff reporting to this man
Director	100
Manager	80
Assistant director	65
Chief chemist (or engineer)	65
Supervisor	40
Group leader	14
Project leader	12

For Nonsupervisory Personnel

... these titles—based on years of experience—are most used:

Title	Years of experience
Assistant	0-4
Assistant chemist (or engineer)	0-4
Junior chemist	0-4
Chemist	1-6
Research chemist	4-10
Senior chemist	7 and more

Wanted: Accord on Titles

The recently compiled survey of the Chicago chapter of the American Institute of Chemists (above) makes this clear: a chemist's title is no clue to his job duties. And that, it reasons, takes much of the meaning out of data gathered in national salary surveys of chemists.

Undertaken by the Chicago AIC's Committee on the Economic Status of Chemists, the study covered 44 companies in the Chicago area.

The committee feels that some sort of agreement on titles would help firms measure their own salary policies against survey results and make needed adjustments. It reasons this way:

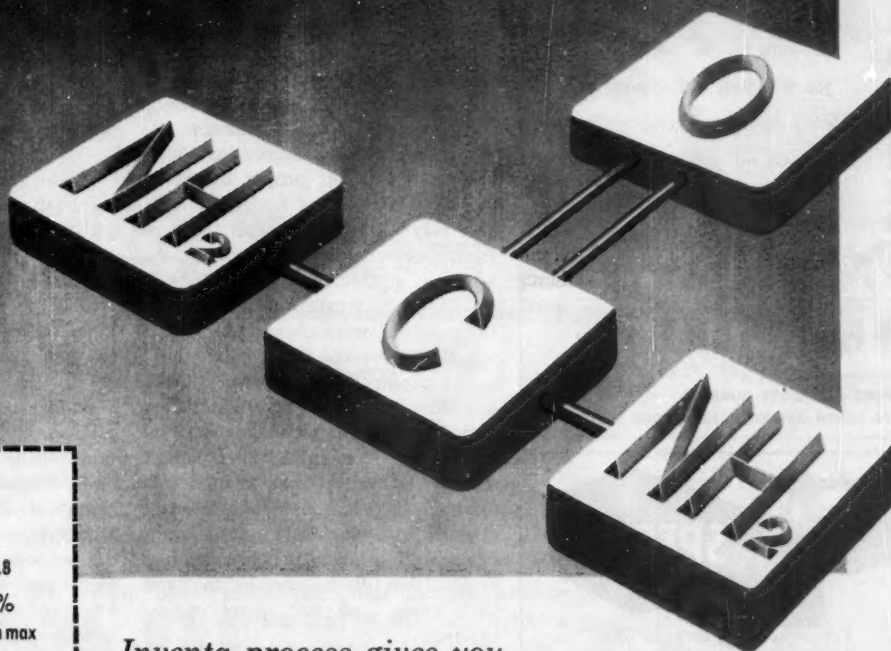
Most salary surveys fail to take into account the individual chemist's

duties and responsibilities, concern themselves primarily with his years of experience. But, the committee believes, many individuals reach the limit of their ability 6-10 years after graduation, and hit a plateau in both salary and responsibility. They tend to depress the average salaries for experienced researchers.

Conversely, the group reasons, certain individuals with special ability and initiative manage to hit a high level of responsibility within a few years of their graduation. And they raise the average in the less experienced group.

Another advantage of standardization is that employers would instantly know where a job applicant fits into their structure—i.e., they wouldn't have to stop to figure out their own

urea



SPECIFICATIONS

PH.....	7-9.8
Water.....	0.5%
Ash.....	35 ppm max
Iron.....	2 ppm max
Free Ammonia.....	175 ppm max
Color.....	10 APHA
Turbidity.....	20 ppm max

PHYSICAL PROPERTIES OF UREA

Molecular Weight.....	60.06
Boiling Point.....	Decomposes
Melting Point.....	132.7 C
Specific Gravity.....	1.335
Heat of Fusion.....	57.8 cal./gram
Heat of Solution in H ₂ O.....	57.8 cal./gram

Inventa process gives you

high-quality urea in prill form

SOHIO's 120-ton per day urea unit is the first in the United States to use the Swiss Inventa process. This process with its specially lined reactor eliminates corrosion and metal contamination, resulting in a dependable supply of highest-quality prilled urea.

What's more, every phase of

Sohio's production is electronically controlled — monitored and logged — to insure high-quality chemical grade urea.

Be sure to contact Sohio first for quality chemicals. A qualified representative will be glad to call on you in person. Prilled urea samples are yours for the asking.

**WE'RE SERIOUS ABOUT
SERVICE AT SOHIO**



SOHIO CHEMICAL COMPANY

FT. AMANDA RD., P. O. BOX 628 • LIMA, OHIO

High-quality industrial chemicals: 83% Ammonium Nitrate Solution . . . Nitric Acid . . . Urea . . . Aqua Ammonia . . . Anhydrous Ammonia (commercial and refrigeration grades)

**AN ODOR PROBLEM TO CON-
TEND WITH? . . .** Let our
Industrial Odorant Division
solve it for you . . . Let our
years of pioneering "know-
how" come to your aid in
eliminating or improving any
objectionable plant or prod-
uct by-odor that may be
bothering you. We can assist
you effectively and econom-
ically—and without obligation
—if you will write us fully
concerning your difficulties.

FRITZSCHE

Brothers, Inc.

Established
1871

PORT AUTHORITY BUILDING

76 NINTH AVENUE, NEW YORK 11, N. Y.



SPERRY

For over 60 years SPERRY
has originated or been closely
identified with every major
filtration development. That's
why you can specify

SPERRY with
confidence
—whether
it's a
standard
or custom-
engineered
Filter Press of
superior filtration

and construction . . . one of
Sperry's quality filter bases
... a powerful Sperry Closing
Device . . . or any Sperry
labor-saving equip-
ment—designed
to solve your
filtration
problems
—best!

**FREE! Write for
complete Sperry Catalog.**

D. R. SPERRY & CO.

Batavia, Ill.

Sales Representatives:
George J. Turbox Alldredge & McCabe
808 Nepperton Avenue 847 E. 17th Ave.
Yonkers, New York Denver 18, Colo.
B. M. Pihlhuus Texas Chemical
833 Merchants Exchange Engr. Co.
Building 4101 San Jacinto
San Francisco 4, Calif. Houston 4, Texas

RESEARCH

companies' equivalent of the appli-
cant's former title.

And, to an applicant, standardiza-
tion would have the advantage of let-
ting him know, with some certainty,
just what type of job he's applying for.

Wide Variation: The biggest need
for standardization of titles, suggests
the committee, is in the supervisory
category. There, 42 companies re-
ported a total of 31 titles in use.

For purposes of the survey, the
committee gauged responsibility by
dividing the number of staffers re-
porting to each title by the total pro-
fessional staff of each company. Most
popular titles, in order of decreasing
responsibility: director, manager, as-
sistant director, chief chemist, super-
visor, group leader, project leader.

Although the need for standardiza-
tion may not be so great in the non-
supervisory category, the survey found
an even greater discrepancy in title
policy. Forty firms used a total of 33
titles for its researchers. The latters'
experience covered 0-20 years.

For nonsupervisory researchers with
less than four years' experience, titles
varied widely; the most popular were
assistant (which included all terms,
such as laboratory assistant, research
assistant, technical assistant), assistant
chemist (or engineer), and junior
chemist. The majority of companies
restrict the title of chemist to those
with more than two years of ex-
perience.

There was closer agreement on
titles for the more experienced re-
searcher. A large number of firms, the
committee finds, use the prefix "re-
search" before the title of a chemist
having more than four years' experi-
ence. The most popular title for the
very experienced professional man is
senior chemist (or engineer).

Part of a Plan: The committee
points out that its survey, part of its
long-range program, was not exhaus-
tive. Its job-title survey is the first
phase; a salary survey is now in the
works. Such surveys are a must, the
committee feels, to get a much-needed
true picture of the economic status
of chemists.

PRODUCTS

Terpene Oxides: Two new epoxy
compounds—dipentene monoxide (DL-
1-methyl-1,2-epoxy-4-isopropenylcy-

clohexane) and α -pinene oxide (D-
2,6,6-trimethyl-2,3-epoxybicyclo[3.1.1]
heptane), are now available from
Becco Chemical Division (Buffalo,
N.Y.) of Food Machinery & Chemical
Corp. Both compounds reportedly have
use as intermediates in the synthesis
of organic compounds—for example,
perfumeries, pharmaceuticals, insecti-
cides.

Pyridine Former: Pyridine N-oxide,
useful for the formation of 4-substi-
tuted pyridine derivatives, is now avail-
able from Beacon Chemical Industries
(Cambridge, Mass.). It's also said to
be suitable for preparing 2-pyridone
and 3-hydroxypyridine.

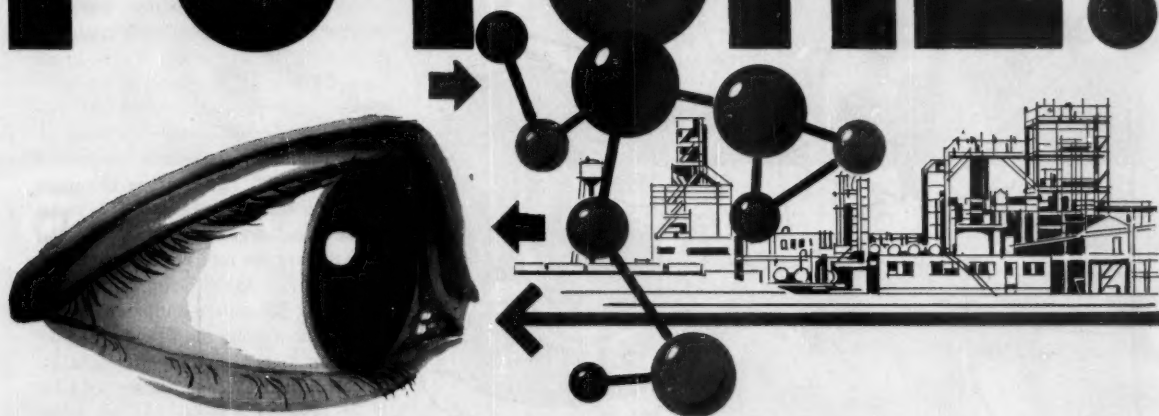
High-Purity Oxide: Research Chem-
icals (Burbank, Calif.) now offers a
commercial grade of dysprosium oxide
of 95% minimum purity. Owing to
the nuclear and ferromagnetic proper-
ties of dysprosium, the newcomer has
potential in the fields of electronics,
reactors, alloys, catalysts and ceramics.

Molybdenum Pellets: High-purity,
high-density molybdenum pellets are
now available in quantity from Syl-
vania Electric Products' Tungsten and
Chemical Division (Towanda, Pa.).
Designed specifically for vacuum-melt-
ing processes used to produce critical
high-temperature alloys, the new pel-
lets come in a standard package con-
taining 80 lbs. of material. Price:
\$4/lb.

Aliphatic Amines: Two new long-
chain aliphatic amines—Armeens O
and OD—are now available from
Armour & Co.'s Chemical Division
(Chicago). Featuring a low solidifica-
tion point and excellent solubility in
common organic solvents (except the
glycols), they have potential in: cor-
rosion inhibition, quaternary produc-
tion, flotation processes, chemical in-
termediates, etc.

Spectrographic Standards: Six new
standard samples of zinc-base alloys
are now available from the National
Bureau of Standards (Washington,
D.C.). Analyzed and certified as to
composition, they're designed for cali-
brating and checking spectrochemical
methods in the analysis of two im-
portant zinc-base die-casting alloys
(ASTM designations: AG40A and
AC41A).

FUTURE!



You, an engineer, are not looking for a job: you're looking for a *future* . . . where recognition comes fast and growth in responsibility follows . . . where the future belongs to engineers like yourself. You'll find such a future at Chemstrand.

Already a leader in the dynamic, expanding field of synthetic fibers, Chemstrand is small enough to offer "ground floor" advantages; large enough to insure your future.

Chemstrand is in the South, the land of the future, where pleasant suburban living, year-'round golf and good fishing are more than just wishes. So, *work* for the future, *live* for the future — plan *your* future with Chemstrand!

C

CHEMSTRAND

THE CHEMSTRAND CORPORATION, DECATUR, ALABAMA

WRITE TODAY Immediate openings available at plants in Pensacola, Florida, and Decatur, Alabama.

TECHNICAL PERSONNEL MANAGER, Dept. CW-7
The Chemstrand Corporation
Decatur, Alabama

Gentlemen:

It is my understanding that you need for immediate employment graduate engineers in various fields, particularly chemical, mechanical, industrial, textile and instrument engineering.

I am a graduate _____ engineer.
Please send me information concerning the ground floor opportunities at Chemstrand.

NAME _____

STREET _____

CITY _____ ZONE _____ STATE _____

TOMORROW'S BIG DECISIONS WILL BE MADE **by the men who act today...**



MOST chemical companies give Christmas business gifts, but even more have. . .

No Relish for the Role

Chemical process firms aren't eager to play Santa Claus this year; in fact, three out of four would like to see the practice of Christmas business-gift-giving discontinued entirely. That's one of the key results uncovered in a just-completed *CW* survey of yuletide gift-giving patterns in 100 of the companies.*

Cost, policy, quantity, quality, motivation and other practices were among the topics investigated. Here are the results:

*Thirty-nine have annual sales under \$5 million, 29 have sales between \$5-25 million, 11 have sales between \$25-50 million and 17 have annual sales of more than \$50 million. About 85% classified themselves "manufacturer or processor," 15% "distributor or agent."

To Give or Not To: About 6 out of 10 concerns give Christmas business gifts. The ratio shows no significant change relative to company size. But a strong correlation arises when size is correlated with the presence or absence of official policy governing gift-giving. Better than 81% of the companies with more than \$50-million annual sales have an official policy. This compares with 45% for the under-\$5-million size, 63% for the \$5-25-million bracket and 73% for the \$25-50-million group.

While many firms control gift-giving, most companies lack an official policy to regulate gift-receiving. The breakdown:

Company Size (in millions)

under \$5
\$ 5 - \$25
\$25 - \$50
over \$50

No Policy

91%
88%
50%
64%

Gifts are most frequently given to customers and prospective customers. About 43% of the chemical companies give presents only to such contacts. And 90% of the givers spend more than 75% of gift budgets on customers and prospects. Presents for "business friends" make up most of the remaining expenditures.

How Much? The average chemical company will spend about 6% more this season than last for business gifts, but will pare the ranks of recipients almost 8%. Only companies in the under-\$5-million-annual-sales-volume bracket plan to give more gifts this year than last, and, as might be expected, their average number of gifts in '56 (142 vs. 136 in '55) per company is vastly lower than the number (1,438) given by the large firms (over \$50 million in annual sales). Companies in the intermediate brackets are giving 3-4 times as many gifts as the small firms.

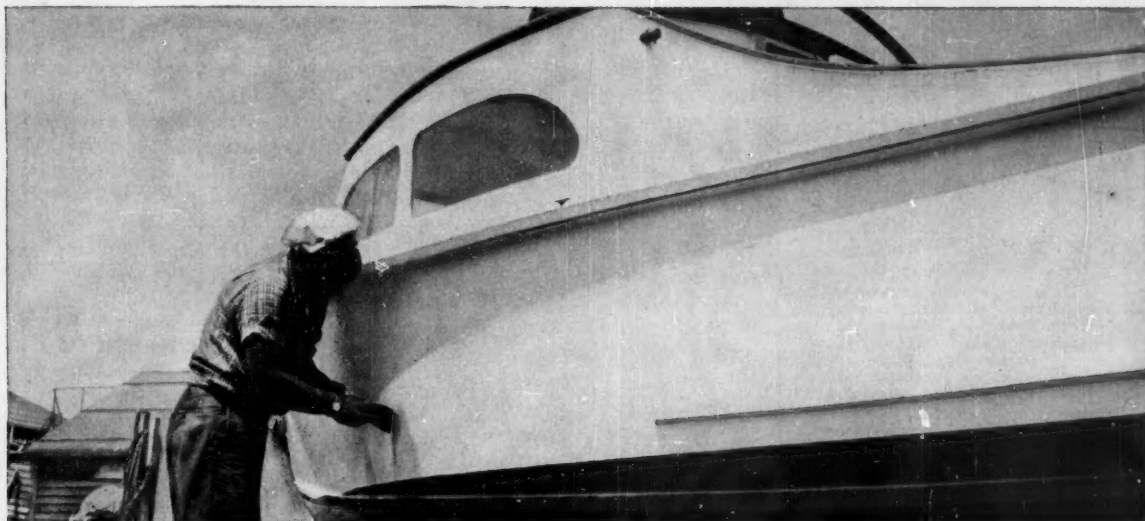
Expenditures to express the season's greetings show this pattern:

Company Size (in millions)	Average Total Cost of Gifts	
	1956	1955
under \$5	\$ 876	\$ 925
\$ 5 - \$25	2,430	2,445
\$25 - \$50	3,275	4,590
over \$50	7,190	6,000

WHAT THE CRITICS SAY —

"Gift practices are nothing but unadulterated bribery; it is amazing that the chemical industry, which prides itself on high standards, permits such a practice to continue."

"It's a valueless and useless thing. I guess that the time spent on the gifts costs three times the actual dollar cost of the gifts."



Your **REMOVER** to take the coating **OFF**



or your **LACQUER** to put the coating **ON**
is superior when you manufacture with Enjay Ketones & Solvents

Whether your products take the coating off or put it on, they'll do it efficiently if they're formulated with Enjay ketones and solvents. Leading manufacturers rely upon the consistent high quality of Enjay active solvents to assure top performance from their lacquers, enamels, varnishes and removers.

For a dependable supply of methyl ethyl ketone, acetone and esters call on Enjay. For technical assistance in the application of *any* Enjay petrochemical, feel free to call on the new, fully staffed and equipped Enjay Laboratories.

Enjay offers a diversified line of petrochemicals for industry:

KETONES AND SOLVENTS (Methyl Ethyl Ketone, Acetone, Isopropyl Acetate, Secondary Butyl Acetate); and a varied line of LOWER ALCOHOLS, HIGHER OXO ALCOHOLS, OLEFINS AND DIOLEFINS AND AROMATICS.



*Pioneer in
Petrochemicals*

ENJAY COMPANY, INC., 15 WEST 51st ST., New York 19, N. Y. Other Offices: Akron, Boston, Chicago, Los Angeles, Tulsa

December 15, 1956 • Chemical Week

109

**Who
makes
the**

*Clearst
Pyrethrum
Extract?*

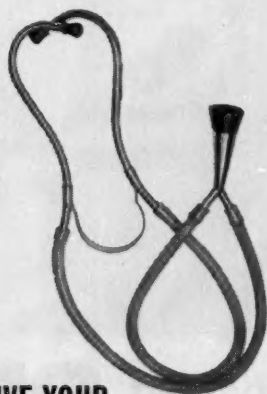
■ As the recognized pioneer in the development and processing of pyrethrum, MGK is the original and first producer of standardized pyrethrum extracts of brilliant clarity.

In addition, we have developed excellent synergized pyrethrum concentrates, dusts and powders. If your insecticidal sprays, dusts or aerosols include the use of pyrethrum in any form, or the use of its companion product allethrin, write for the latest authoritative data. We also have available recent information concerning the most effective synergists, MGK 264 and piperonyl butoxide.



**McLAUGHLIN
MGK
ORMLEY
ING Company**

1713 S. E. 15TH STREET / MINNEAPOLIS, MINNESOTA



GIVE YOUR DOCTOR A CHANCE

400,000 Americans, leading active lives today, are living proof of the fact that cancer can be cured if detected in time. Give your doctor a chance to give you this protection by having a physical checkup every year of your life. This should include a chest x-ray for men; for women, a pelvic examination. Make it a habit... for life.

AMERICAN CANCER SOCIETY

SALES

The greatest amount spent by any company with sales of over-\$50 million was \$17,500—for 4,900 gifts.

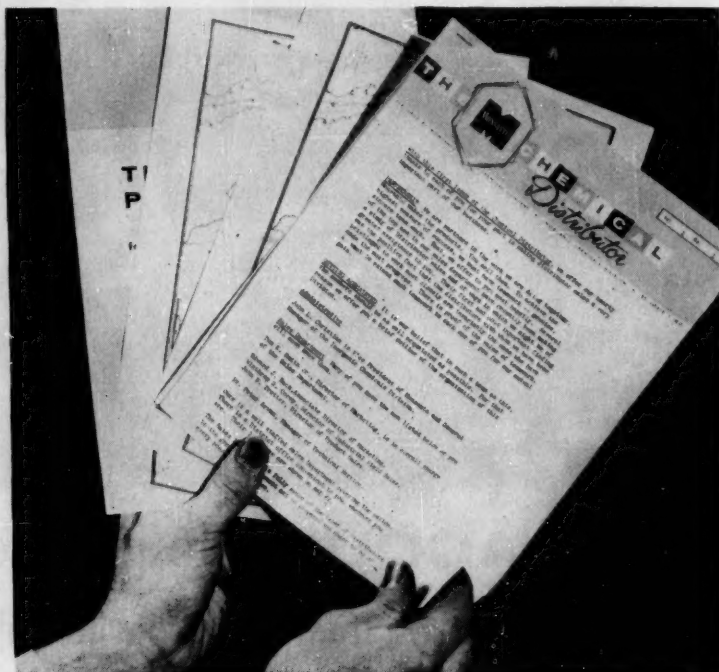
Presents in the intermediate price brackets account for most gifts given by chemical process companies. Twenty-seven firms spend most of their gift budgets on items costing \$5 to \$10. Eighteen companies allot the bulk of their gift expense to presents in the \$2.50-5 bracket, while eight spend in the \$10-25 category. Average gift costs:

Company Size (in millions)	Average Cost per Gift
under \$5	\$6.16
\$ 5 - \$25	5.93
\$25 - \$50	4.85
over \$50	5.00

Selection: The present the customer or business friend gets is more than likely to be identical with that given to others by the same company; gift standardization is widespread among the chemical process industries. With the exception of the largest firms, the percentage of standardized gifts mounts as company size increases:

Company Size (in millions)	Companies in Which 90-100% of Gifts Are Standardized
under \$5	65%
\$ 5 - \$25	72
\$25 - \$50	80
over \$50	50

In contrast, only a few companies favor sending gifts selected specifically for the individual. Thirteen percent of



'Distributor' for Distributors

THE TREND to distributor development programs took a new step recently as Monsanto launched the first issue of a periodical for its distributors. The idea for the publication came from Monsanto's petroleum affiliate, Lion Oil, which has had a distributor publication for

some time. Monsanto plans to publish the mimeographed organ semi-monthly, send it to approximately 200 distributors. First issue is a get-acquainted effort; subsequent ones will hit topics of specific interest to distributors. In charge of the project is William R. Corey.



One of a kind!

Kids still love jackknives, but no longer seem to do much whittling. Like the circus big-top this vanishing pastime seems to be one more casualty of this high-G, triple-carburetion age.

The production engineer also has lost his enthusiasm for whittling metal. Machining from solid bar is still a necessity when making one part or a few prototypes. But, for hundreds of parts, extruded shapes save metal and machining time.

TMCA has pioneered the difficult art of extruding Titanium alloys. Many thousands of pounds of extruded Titanium sections are regularly shipped to jet engine and airframe industries. Seamless extruded tubing is another regular production item at TMCA.

Write today for information on Titanium extruded shapes and tubing.

... FIRST IN **Titanium**...



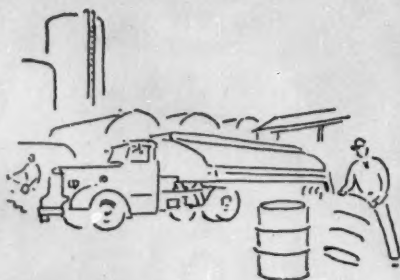
TITANIUM METALS CORPORATION OF AMERICA, 233 Broadway, New York 7, N.Y.

December 15, 1956 • Chemical Week

111

WE SUPPLY AROMATIC SOLVENTS

from our NEWARK warehouse



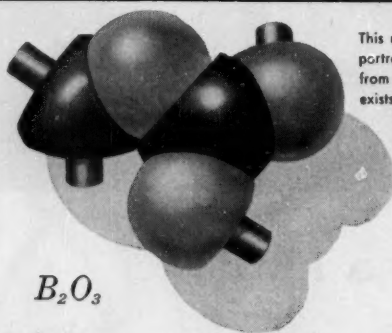
Benzol — Toluol — Xylol
Super Hi-Flash Naphtha
"Amsco-Solv"* Intermediate
Aromatics

ALCOHOLS
KETONES
ESTERS
GLYCOL ETHERS
PLASTICIZERS
CHLORINATED
SOLVENTS
GLYCOLS
AMINES
AROMATIC
SOLVENTS
ALIPHATIC
NAPHTHAS

* Registered
Trade Mark

THE
CHEMICAL SOLVENTS
INCORPORATED

60 PARK PLACE, NEWARK 2, NEW JERSEY — Market 2-3650 WOrth 2-7763



This molecular model
portrays a fragment
from the network which
exists in B_2O_3

B_2O_3

...it's our specialty

In fact, we were borate specialists before this age of specialization. When this century began, our mines, refinery and laboratory were already working toward one end...to supply industry with the greatest variety of borates, compounds, concentrates, ores, and boron chemicals ever known to man. So, when you need B_2O_3 —think of PCB.

Are you acquainted with these products?

- | | |
|---|--|
| <input type="checkbox"/> Borax | <input type="checkbox"/> Ammonium Biborate |
| <input type="checkbox"/> Boric Acid | <input type="checkbox"/> Ammonium Pentaborate |
| <input type="checkbox"/> Borax 5 Mol | <input type="checkbox"/> Potassium Pentaborate |
| <input type="checkbox"/> Anhydrous Borax | <input type="checkbox"/> Potassium Tetraborate |
| <input type="checkbox"/> Borax Glass | <input type="checkbox"/> Sodium Metaborate |
| <input type="checkbox"/> Gerstley Borate (Ore) | <input type="checkbox"/> Elemental Boron* |
| <input type="checkbox"/> Borster® Boric Acid Esters* | |
| <input type="checkbox"/> Anhydrous Rasorite® Sodium Borate Concentrates | |
| <input type="checkbox"/> Rasorite® Sodium Borate Concentrates | |

*New Product

For technical bulletins, address: 100 Park Avenue, New York 17

United States Borax & Chemical Corporation

PACIFIC COAST BORAX COMPANY DIVISION



MANUFACTURERS OF FAMOUS "20 MULE TEAM" PACKAGE PRODUCTS

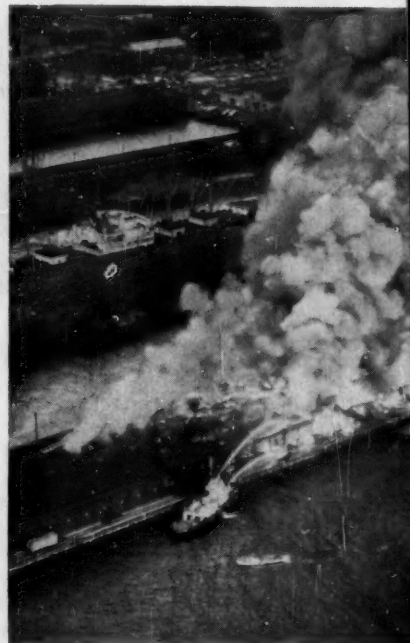
Los Angeles
New York
Chicago
Kansas City
Philadelphia
Cleveland

SALES

companies that have less than \$5 million annual sales, and 6% in the \$5-\$25-million class report that 90-100% of their gifts are "individually selected." The large firms are again the exception—40% of those with yearly sales volumes over \$50 million select 90-100% of their gifts individually.

Whether a company buys gifts individually or by the gross, its salesmen are likely to have a voice in choosing gift recipients. Over 93% of all gift-giving companies consult their salesmen on how to dispense the bounty. And, generally speaking, sales management has a strong voice in gift selection, recipient selection and over-all supervision of the Christmas business-gift program.

Motivation: Why do chemical process companies give holiday remembrances? *CW* finds considerable diversity of opinion on this point and only



Tragic Fire

FIRE AND EXPLOSION that rocked the waterfront in Brooklyn last week caused this scene of tragedy at the 1,740-ft.-long pier leased by Luckenbach Steamship Lines. Tons of flammable material piled along the pier contributed to the waterfront's worst

rough generalizations can be made. About 30% listed goodwill as the main reason for giving; 26% ascribed it to tradition; 21% to appreciation of past business; 11% to meet competitors; 11% for miscellaneous reasons.

The reasons advanced for yuletide giving show that few companies have a compelling need to continue a practice that can run into real money. Add this to the strong desire—on the part of 75% of respondents—to stop Christmas business-gift-giving, and the future of the practice appears dark. But traditions die hard. About 45% of the gift-givers have the same budget this year as last; 30% will increase their gift spending; 25% will decrease such expenses. Thus it figures that it will likely be a long time—if ever—before a substantial decrease in Christmas giving occurs among the firms that still subscribe to the practice.

Greeff

SERVING THE CHEMICAL
INDUSTRY SINCE 1880

TETRA ETHYL ORTHO SILICATE

Di Siloxanes

Montrose new production of the highest purity Tetra Ethyl Ortho Silicate and Di Siloxanes are now available.

Samples and specifications are available upon request.

R. W. GREEFF & CO., INC.

10 ROCKEFELLER PLAZA, NEW YORK, N. Y.
TRIBUNE TOWER, CHICAGO, ILLINOIS

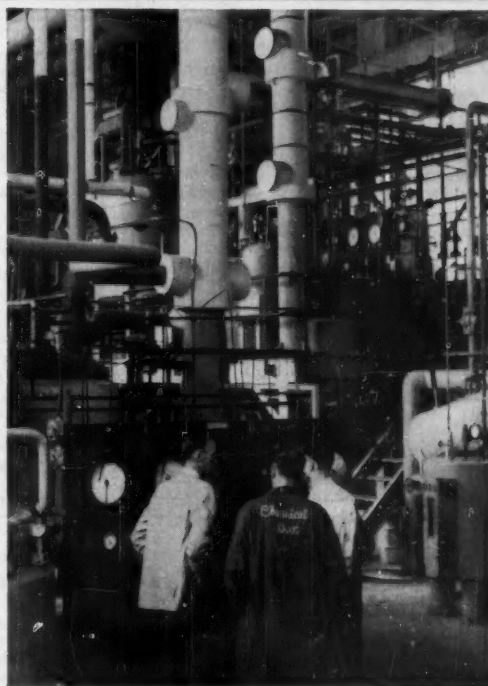


Fed by Chemicals

fire. Some of the materials that combined to help push flames 500 ft. high: shellac, varnish, rubber cement, naphtha. Estimated damage: \$15 million. A freighter containing sisal being unloaded at the pier was quickly tugged away, undamaged.

"MH Lithium Aluminum Hydride is the reducing agent we needed!"

In plant after plant, research and production men have found the versatility and wide range of new applications for lithium aluminum hydride the solution to tough reduction problems. Why? Because this flexibility of application, coupled with ease of handling, fast action, safety and high yields have made MH lithium aluminum hydride the finest specific reducing agent available for acids, esters, aldehydes, ketones, acid anhydrides, acid chlorides, amides, nitriles and aldimides!



CHEMICAL HYDRIDES DIVISION

Metal Hydrides Incorporated

1215 CONGRESS STREET • BEVERLY, MASSACHUSETTS

EMPLOYMENT OPPORTUNITIES

IN THE CHEMICAL PROCESSING INDUSTRIES

• **Displayed Rate**—\$38.00 per inch effective Jan. 1957. Frequency rates on request. Advertising inch measures 1/8 inch vertically on one column. Subject to Agency Commission. 3 columns to a page.

• **Closing Date**—Each Tuesday, 11 days prior to publication date.

NATIONAL COVERAGE

• **Undisplayed Rate**—\$1.80 a line, minimum 3 lines. To figure advance payment, count 5 average words as a line. 10% discount if full payment made in advance for 4 consecutive insertions. Position wanted ads 1/2 above rate.

• **Box Numbers** count as one additional line.

Send NEW ADS & INQUIRIES to Classified Adv. Div.
of Chemical Week; P.O. Box 12, N.Y. 36, N.Y.

Chemical Market Analyst

Nationally known progressive chemical manufacturer in the fatty acid and derivatives field is in need of a Chemical Market Analyst. Must have chemistry or ChE degree. Graduate work in marketing or economics desirable. Minimum experience of one to three years in the chemical marketing research area. This experience preferably should be in the area of market determination for new products rather than statistical analysis. The successful candidate will be responsible for determining markets for new chemical products. Chicago headquarters with some traveling involved. Send resume of qualifications with salary history to:

J. F. Finnerty

Armour Chemical Division

1355 West 31st Street, Chicago 9, Illinois

CHEMIST SPECIALTIES OR WAX EMULSIONS

We require a man experienced in the development of waxes, polishes, or other chemical specialties. Must be able to test against specifications. Age under 40 preferred, but "know how", initiative, and determination to grasp opportunities is the prime requisite.

We suggest you investigate this opportunity afforded by one of the most modern and up to date laboratories of its kind. Congenial environment, company paid for retirement program, and a liberal salary arrangement to the right man, make this a very worthwhile proposition.

Please phone Mr. C. W. McDermott,
Trinity 7-6200

Franklin Research

5134 Lancaster Ave., Phila. 31, Pa.

CHEMICAL SALES TRAINEE

Large national corporation needs a man under the age of 30, with a Bachelor degree in chemistry or chemical engineering, for position of chemical salesman. Upon completion of training in Chicago must be willing to relocate any part of the United States. Write giving complete résumé of family background, education, work experience (if any), and salary desired.

P-3685, Chemical Week

520 N. Michigan Ave., Chicago 11, Ill.

Exceptional Opportunity for CHEMICAL ENGINEER

A highly successful and steadily expanding manufacturer of heavy machinery for the process industries offers an unusual fine sales engineering opening and an assured future for a man with production, engineering or development experience. If you qualify, this is one you will want to investigate. Write fully, covering your educational and industrial background, to P-3729 Chemical Week Class. Adv. Div., P. O. Box 12, N.Y. 36, N.Y.

Space Salesmen Wanted

We are looking for sales trainees to sell advertising space for CHEMICAL ENGINEERING or CHEMICAL WEEK. No selling experience necessary. Age requirement 21-30 years. Opportunities unlimited. Send complete résumé or phone for appointment. Contact Steven J. Shaw, Advertising Sales Manager, CHEMICAL ENGINEERING • CHEMICAL WEEK, McGraw-Hill Publishing Co., 330 W. 42nd St., New York 36, N. Y. Phone: LOngacre 4-3000. Ext. 693.

PATENT ATTORNEY

Excellent opportunity for young Patent Attorney to work with Research & Development Division on patents and legal problems associated with new process and product development. Qualified candidate should have two to five years experience in patent procedures with the chemical or textile industries, a law degree, plus a knowledge of chemistry or chemical engineering. Salary commensurate with experience.

Send resume stating qualifications and salary requirements to:

Technical Personnel Manager
Box R-21

The Chemstrand Corporation
Decatur, Alabama

SEE CHEMSTRAND'S AD on
Page 107 of THIS MAGAZINE

Positions available for

ENGINEERS

(Chemical, Mechanical, Metallurgical, Textile, Industrial, Instrument an Civil) and

CHEMISTS

(Organic, Physical, Analytical—Instrumental and Wet Method, Textile Chemists.)

Write to Technical Personnel Department
THE

CHEMSTRAND

CORPORATION
Decatur, Alabama

SALESMEN

INDUSTRIAL CHEMICALS

Unusual opportunities with rapidly expanding chemical firm. Salary and expense plus commission and bonus. Car furnished, top employee benefits. Qualified applicants age to 35.

Mail Resume To Personnel Dept.

NATIONAL ALUMINATE CORP.

6216 W. 66th Place Chicago 38, Illinois

Selling Opportunity Offered

Colorado Mfg. Agent offers technical sales representation, industrial lines. RW-3709, Chemical Week.

Positions Wanted

(Female) Executive Assistant. Secretary, B.S. Chemistry, aptitude for figures, experienced editing, technical reports, high caliber, excellent references, responsible, desires non-routine position. New York Metropolitan area. PW-3716, Chemical Week.

Recent Chemical Engineer Graduate, top half of class from Ivy League School, with a year's experience in inorganic and petroleum refining fields. Desires position with a chemical firm in Phila. area in process design or development work, also interested in responsible and challenging position as Ch.E. in firm not necessarily involved in production of chemicals. PW-3749, Chemical Week.

TRACERS

CUSTOM GRINDING

- Ultra Fine or Coarse
- Specialty or Volume
- Heat Sensitive Materials
- Complete Bland and Grinding service on unit or contract basis

A. Cramer Corp. 10881 S. Central Avenue
Box 682 Oak Lawn, Illinois

SURPLUS CHEMICALS WANTED

Chemicals—By-Products—Plasticizers

Pigments—Resins—Solvents

CHEMSOL, INC.

70 Dod Street, Elizabeth, N.J. EL 4-7654

BUYERS OF SURPLUS

CHEMICALS—OILS—SOLVENTS

DRUGS—RESINS—WAXES

PLASTICS—COLOR—ETC.

BARCLAY CHEMICAL COMPANY, INC.

75 Varick Street New York 13, N. Y.
WORTH 4-5120

SURPLUS WANTED

CHEMICALS, PHARMACEUTICALS, OILS
PLASTICIZERS, RESINS, DYES
SOLVENTS, PIGMENTS, ETC.

CHEMICAL SERVICE CORPORATION

96-02 Beaver Street, New York 5, N. Y.
HANover 2-6970

For Sale

J. H. Day Stainless Steel Sigma Blade Mixers 5, 50 & 75 gal. jacketed; 200 gal. non jacketed. Perry Equipment Corp., 1415 N. 6th St., Phila. 22, Pa.

F. J. Stokes 3'D x 10'L Rotary Vacuum Dryer, jacketed; with drive, condenser, etc. Perry, 1415 N. 6th St., Phila. 22, Pa.

Approx. 24,500 gal. Horizontal Aluminum Tank, 10'D x 40' long, 1/2" thick shell, 3/4" thick dish heads. Perry, 1415 N. 6th St., Phila. 22, Pa.

Glass-Lined Tanks—We can offer some surplus tanks that we have available, including 10 one-piece glass enamel lined tanks measuring 9' diameter by approx. 10'6" high, cap. 4100 gallons each with stands and manholes, at a very attractive price f.o.b. truck shipping point. One or more tanks can be purchased at one time. Complete details by writing FS-3666, Chemical Week.

Stainless Tanks—Ten 525-gal. each stainless mixing tanks, 56" dia. x 48" high with 3/4 HP, 60 cycle, 3 phase, AC motor, like new, immediate delivery. FS-3668, Chemical Week.

Air Compressor—9" x 8" twin-cylinder air compressor, cap. 200 CFM at 350 RPM with 40 HP, 220/440 volt, 3-phase, AC motor, complete with all automatic controls, factory rebuilt, immediate delivery. FS-3670, Chemical Week.

Sulfinator—Pfaudler Type P 50-gal. glass-lined sulfinator, Model 805, like new, immediate delivery, price 50% of new, f.o.b. Western New York shipping point. FS-3671, Chemical Week.

For Sale—American Tool 40 x 24 stainless suspended type centrifugal, used few weeks only, immediate delivery, complete with motors and all accessories. FS-3652, Chemical Week.

Business Opportunity

Chemical manufacturing company wishes to purchase minority or larger interest in moderate size chemical manufacturing company for alignment with similar enterprises. Replies treated confidentially. BO-3637, Chemical Week.

Plant for Rent

Patterson, N.J. One story brick, 26,000 sq. ft. sprinklered high pressure steam, B.R. siding, underground storage tanks, fenced yard, unrestricted. PFR-2174, Chemical Week.

MANAGEMENT SERVICES

NORMAN APPELZWEIG ASSOCIATES

Specialists in Applied Biochemistry
Product Development Consultants to the Food, Drug and Cosmetics Industries.

131 Christopher Street
New York 14, New York

FOOD RESEARCH LABORATORIES, INC.

Founded 1922

Research • Analyses • Consultation
Chemical, Nutritional, Toxicological Studies
for the Food, Drug and Allied Industries

48-14 33rd Street
Long Island City 1, N.Y.

WALTER KIDDE CONSTRUCTORS, INC.

Engineers—Builders

chemical—process—paper

New York City

Houston, Tex. Baton Rouge, La.

JAMES P. O'DONNELL

Consulting Engineer

Professional Engineering for the
Petroleum and Process Industries

39 Broadway
New York 6, N.Y.
Beaumont, Texas Tulsa, Oklahoma

SIRRINE

ENGINEERS

Plant design & Surveys covering Chemical Electrochemical and Metallurgical Production; Industrial Waste Disposal; Water Supply & Treatment; Analysis & Reports

J. E. SIRRINE CO.

Greenville South Carolina

ROGER WILLIAMS

Technical & Economic Services, Inc.

- Chemical Economics
- Chemical Market Research
- Product Evaluation

Main Office: PO Box 426, Princeton, N. J.

Princeton 1-0209

New York Office: 148 East 38th St., NYC 16
Murray Hill 5-5257

Wisconsin Alumni Research Foundation

Project Research Consultation and Production Control Service in Biochemistry, Chemistry, Bacteriology, Pharmacology, and Insecticide Testing and Screening.

Write for price schedule

Wisconsin Alumni Research Foundation
P.O. Box 2059-G • Madison 1, Wisconsin

Professional Assistance

in solving your most difficult problems
is offered by consultants whose cards
appear in this section.

SALES

COMPETITION

• Frontier Chemical Co. will soon establish a storage terminal for caustic soda at Grants, N.M. Tank-truck shipments of 50% liquid caustic soda will originate from there.

• Calvert-Mount Winans Co. (Baltimore) has appointed The O. Hommel Co. as its sales representative to promote C-MW's entire line of polyesters, alkyds and polyvinyl acetate emulsions in the Pittsburgh area.

• Aceto Chemical Co. (Flushing, N.Y.) has been appointed sales representative for Pure Chemicals, Ltd. (Liverpool, England). Under the new arrangement, Aceto will maintain warehouse stocks of isopropyl bromide, n-propyl bromide and octyl bromide in New York.

• General Electric has reorganized the sales force of its Silicone Products Division, created two new sales districts: Chicago and Los Angeles.

• Northwest Nitro-Chemicals Ltd. (Medicine Hat, Alberta) has started distributing Nitro-Cubes, new ammonium nitrate fertilizer. The company will soon expand its new \$21.5 million phosphate-fertilizer plant.

• Union Oil Co. of California plans to turn over the management and operation of its tank-ship fleet to its subsidiary, Pacific Coast Transport Co. The changeover is in line with Union Oil's policy of contracting for services not directly connected with the production, manufacturing and marketing of petroleum and petroleum products.

• International Minerals & Chemical has moved its New York offices to larger quarters at 485 Lexington Ave. The national headquarters at Chicago will move in 1958 to offices and research facilities now being constructed in Skokie, a Chicago suburb.

• American Potash and Chemical has readjusted Eastern states territorial distribution of its refrigeration products. Two representatives have been added to handle territories (New York and New Jersey area, and New England) previously covered out of the corporation's New York office.

• McKesson & Robbins has established a new East Central district office for its chemical department—4500 Euclid Ave., Cleveland. The company's chemical distribution business in Ohio, Michigan and western portions of Kentucky and Pennsylvania will be directed from the new office.

CHEMICAL WEEK • ADVERTISERS INDEX

December 15, 1956

ACE GLASS, INC. 57
Agency—Ray Hawley, Adv.

ALUMINUM CO. OF AMERICA 23
Agency—Ketchum, MacLeod & Grove, Inc.

AMERICAN BRITISH CHEMICAL
SUPPLIES, INC. 82
Agency—Richard Lewis, Adv.

AMERICAN MINERAL SPIRITS CO. 22
Agency—Leo Burnett Co.

AMERICAN POTASH & CHEMICAL CORP. 93
Agency—McCarty Co.

ATLANTIC REFINING CO. 98
Agency—N. W. Ayer & Son, Inc.

BAKELITE CO., DIV. OF UNION CARBIDE
& CARBON CORP. 67
Agency—J. M. Mathes, Inc.

BAKER CHEMICAL CO., I. T. 58-59
Agency—Wildrick & Miller, Inc.

BALTIMORE & OHIO RAILROAD 90
Agency—Richard A. Foley Adv., Inc.

BARECO WAX CO. 92
Agency—John C. Fellows Co., Adv.

BUFFALO FORGE CO. 26
Agency—Melvin F. Hall Co.

CARBIDE & CARBON CHEMICALS CO.,
DIV. OF UNION CARBIDE & CARBON
CORP. 2, 63
Agency—J. M. Mathes, Inc.

CELANESE CORP. OF AMERICA 101
Agency—Ellington & Co., Inc.

CHEMICAL SOLVENTS INC., THE C. P. 112

CHEMSTRAND CORP. 187
Agency—Robert Luckie & Co.

CLARK EQUIPMENT CO. 80
Agency—Marsteller, Rickard, Gebhardt & Reed,
Inc.

COLUMBIA SOUTHERN CHEMICALS CORP. 13
Agency—Ketchum, MacLeod & Grove, Inc.

COMMERCIAL SOLVENTS CORP. 55
Agency—Fuller & Smith & Ross, Inc.

CONTINENTAL OIL CO. 40
Agency—Benton & Bowles, Inc.

CURTISS-WRIGHT CORP. 35
Agency—Burke, Dowling, Adams, Inc.

DAVENPORT MACHINE & FOUNDRY CO. 94
Agency—Bawden Bros., Inc.

DAVISON CHEMICAL CO., DIV. OF W. R.
GRACE & CO. 15
Agency—St. Georges & Keyes, Inc.

DELTA TANK MANUFACTURING CO. 73
Agency—Sowell Advertising Agency, Inc.

DIAMOND ALKALI CO. 62
Agency—Fuller & Smith & Ross, Inc.

DICALITE DIV., GREAT LAKES CARBON
CORP. 66
Agency—Darwin H. Clark Co.

DOW CHEMICAL CO., INC., THE 33
Agency—MacManus, John & Adams, Inc.

DRAVO CORP. 83
Agency—Ketchum, MacLeod & Grove, Inc.

DU PONT DE NEMOURS & CO., INC.,
E. I., EXPLOSIVES DEPT. 61
Agency—Batten, Barton, Durstine & Osborn,
Inc.

DU PONT DE NEMOURS & CO., INC.,
E. I., ORGANIC CHEMICALS DEPT. 37
Agency—Batten, Barton, Durstine & Osborn,
Inc.

EASTERN STATES CHEMICAL CORP. .. 60
Agency—Ruthrauff & Ryan, Inc.

EASTMAN CHEMICAL PRODUCTS, INC. 20
Agency—Fred Wittner Adv.

EMERY INDUSTRIES, INC. 89
Agency—Ruthrauff & Ryan, Inc.

ENJAY CO., INC. 109
Agency—McCann-Erickson, Inc.

ETHYL CORP. 19
Agency—H. B. Humphrey, Alley & Richards,
Inc.

FISHER CHEMICAL CO., INC. 3
Agency—Fretwald & Coleman, Adv.

FOOD MACHINERY & CHEMICAL CORP.,
ORGANIC CHEMICALS DIV. 27
Agency—French & Preston, Inc.

FOOD MACHINERY & CHEMICAL CORP. 78
Agency—James J. McMahon, Inc.

FOSTER WHEELER CORP. 11
Agency—Marsteller, Rickard, Gebhardt & Reed,
Inc.

FRITZSCHE BROTHERS, INC. 106

GENERAL AMERICAN TRANSPORTATION
CORP., TANK CAR DIV. 14
Agency—Weiss & Geller, Inc.

GENERAL CHEMICAL DIV., ALLIED
CHEMICAL & DYE CORP. 3rd Cover
Agency—Atherton & Currier, Inc.

GENERAL ELECTRIC CO. 77
Agency—Benton & Bowles, Inc.

GENERALS MILLS, INC. 84-85
Agency—Knox Reeves Adv., Inc.

GREEFF & CO., R. W. 113
Agency—The House of J. Hayden Twiss

HALL CO., THE C. P. 64
Agency—Cruttenden & Eger Assoc.

HARCHEM DIV., WALLACE & TIERNAN,
INC. 56
Agency—Branstater Assoc., Inc.

HARSHAW CHEMICAL CO., THE 88

HAVEG INDUSTRIES, INC. 65
Agency—The Roland G. E. Ullman Organization

HERCULES POWDER CO. 86
Agency—Fuller & Smith & Ross, Inc.

HUDSON ENGINEERING CORP. 1
Agency—Brennan-McGarry-Robinson, Inc.

HUDSON PULP & PAPER CORP. 81
Agency—Wilbur & Clangio Adv., Inc.

LINDE AIR PRODUCTS CO., DIV. OF
UNION CARBIDE & CARBON CORP. 4-5
Agency—J. M. Mathes, Inc.

McKESSON & ROBBINS, INC. 94
Agency—Dancer Fitzgerald-Sample, Inc.

McLAUGHLIN GORMLEY KING CO. 110
Agency—Alfred Colie Co.

MERCHANTS CHEMICAL CO., INC. 91
Agency—G. M. Basford Co.

METAL & THERMIT CORP. 24
Agency—RAF Advertising, Inc.

METAL HYDRIDES, INC. 113
Agency—Creamer-Trowbridge Co.

MONSANTO CHEMICAL CO., INORGANIC
CHEMICALS DEPT. 8-9
Agency—Gardner Adv. Co.

NATIONAL ANILINE DIV., ALLIED
CHEMICAL & DYE CORP. 23
Agency—James J. McMahon, Inc.

NORFOLK & WESTERN RAILWAY 12
Agency—Houck & Co., Inc.

OLIN MATHIESON CHEMICAL CORP. 2nd Cover
Agency—Doyle, Kitchen & McCormack, Inc.

PETRO-CHEM DEVELOPMENT CO., INC. 71
Agency—Sam J. Gailay Co., Adv.

PITTSBURGH COKE & CHEMICAL CO. 95
Agency—W. S. Walker Adv., Inc.

PROCON, INC. 6
Agency—Sam J. Gailay Co., Adv.

ROHM & HAAS CO. 7
Agency—Arndt, Preston, Chapin, Lamb & Keen,
Inc.

SEMET-SOLVAY PETROCHEMICAL DIV.,
ALLIED CHEMICAL & DYE CORP. 18
Agency—Atherton & Currier, Inc.

SHAWINIGAN RESINS CORP. 103
Agency—Wilson, Balgait, Welch & Grove, Inc.

SOHIO CHEMICAL CO. 105
Agency—Klaus-Van Pieterse-Dunlap, Inc.

SOLVENTS & CHEMICALS GROUP, THE 10
Agency—Weiss & Geller, Inc.

UNION BAG-CAMP PAPER CORP. 39
Agency—Smith, Hagel & Knudsen, Inc.

UNITED STATES BORAX & CHEMICAL
CORP., PACIFIC COAST BORAX CO. ... 112
Agency—Howard M. Irwin & Co.

VULCAN CONTAINERS, INC. 21
Agency—Critchfield & Co.

WITCO CHEMICAL CO. 4th Cover
Agency—Hazard Adv., Co.

WOLF & CO., JACQUES 74
Agency—Riedl & Freedo, Inc.

WYANDOTTE CHEMICALS CORP. 68-69
Agency—Brooks, Smith, French & Dorrance,
Inc.

tracers SECTION

(Classified Advertising)

F. J. Eberle, Business Mgr.

CHEMICALS: Offered/Wanted 115

EMPLOYMENT 114

EQUIPMENT: Used/Surplus New
For Sale 115

WANTED 115

MANAGEMENT SERVICES 115

SPECIAL SERVICES 115

ADVERTISING STAFF

Atlanta 3 Robert H. Powell
Rhodes-Haverty Bldg., Walnut 5778-2483

Boston 16 350 Park Square Building
Hubbard 2-7160

Chicago 11 Alfred D. Becker, Jr.
Francis E. Stewart, 320 N. Michigan
Ave., Mohawk 4-5800

Cleveland 15 Vaughan K. Dissette,
1510 Hanna Bldg., Superior 1-700

Dallas 2 Gordon L. Jones, Adolphus
Tower Bldg., Main & Ackard Sts., River-
side 7-5064

Detroit 26 856 Penobscot Bldg.,
Woodward 2-1795

London H. Lagler, McGraw-Hill House
95 Farrington St., E.C. 4, England

Los Angeles 17 Peter Carberry, 1125
West Sixth St., Madison 6-9351

New York 36 Knox Armstrong,
P. F. McPherson, Charles F. Onasch,
L. Charles Todaro, 330 West 42 St.
LOngacre 4-3000

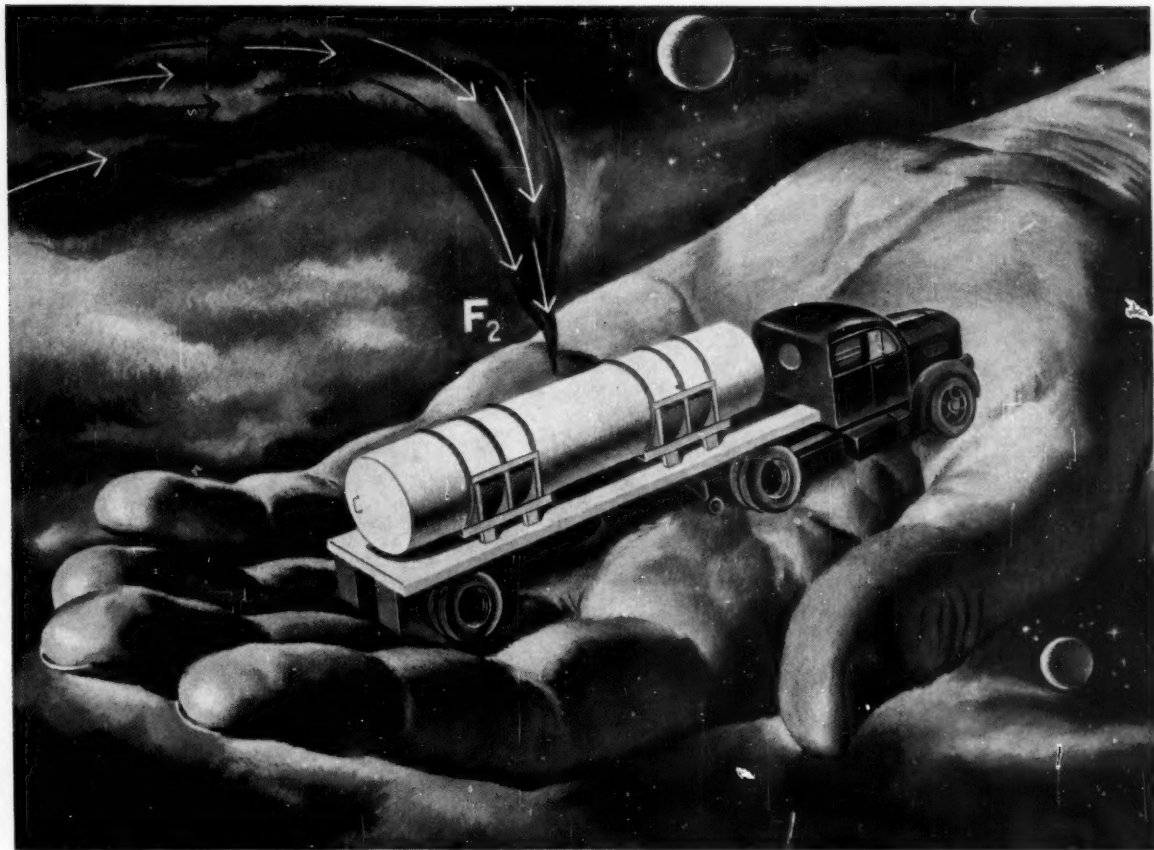
Philadelphia 3 William B. Hannum, Jr.
Architects Bldg., 17th & Sansom Sts.,
Rittenhouse 6-0670

Pittsburgh 22 919 Oliver Bldg.
Atlantic 1-4707

San Francisco 4 William C. Woolston,
68 Post St., Douglas 2-4600

St. Louis 8 3615 Olive St.,
Continental Bldg., Jefferson 5-4867

**Now! Elemental Fluorine Available in Bulk
... and in Easy-To-Use Liquid Form**



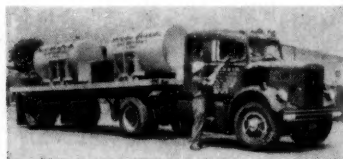
**GENERAL CHEMICAL Announces
TONNAGE SHIPMENTS
OF Liquid Fluorine!**

Large scale transportation of elemental fluorine is now possible and practical. This most reactive of all elements has been tamed and harnessed by General Chemical for industrial use . . . by anyone, anywhere . . . without requiring captive plant facilities.

As a result of General Chemical research, fluorine can now be stored, transported and handled directly as a liquid in tank-truck tonnages. Large quantities can be used with far greater economy, simplicity and safety than has ever been possible with the normally gaseous form.

If your production or research pro-

gram involves fluorine or fluorine-supplying chemicals, look into General's liquid fluorine development without delay. It makes possible new approaches to your problems that were impossible before. As a first step, write today for our comprehensive new technical bulletin, "Fluorine." It contains a wealth of helpful data.



Product Development Department
GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.



Basic Chemicals for American Industry



Season's Greetings and best wishes for the New Year



36 Years of Growth

WITCO CHEMICAL COMPANY

122 East 42nd Street, New York 17, N. Y.

Associated Companies:

Ultra Chemical Works, Inc.
Emulsol Chemical Corporation

Continental Carbon Company
Pioneer Products Division